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Reclamation and Embanking by Vegetable Growths.

LEGISLATION on the land, no matter what particular direction it may take, is likely to lead to the reclamation of waste lands, and the protection of other land subject to river and tidal action, some information on methods of reclamation of a practical character, not involving expensive engineering works, will be found useful to landowners, tenants, and others. An experience extending over many years, in several parts of the three kingdoms, inland and on the seaboard, has convinced us that works of a similar character to what were successfully carried out several years ago can be attempted and accomplished again, and with far greater advantage resulting. We cannot increase the size of the British islands, ordinarily understood, but we can put more waste, mountain, and bog land under cultivation, yea, and "slob land," too, by winning the latter back from the action of the sea. Thousands upon thousands of acres of our sea margin and foreshores can be rescued and made profitable for farming, not to speak of building purposes, by the expenditure of no great amount of common labour, and by enlisting nature in our service. Our purpose in this paper is not to enter into methods and details of the best forms of works of reclamation and embanking where cost is not a matter of vital consideration, or when State or associated interests are ready to supply the needed capital. For these methods of reclamation and embanking there is plenty of available engineering talent, but the work we have in view is reclamation by more simple yet certain methods, and principally through vegetable growths. The sea-reed or bent (the *Arundo arenaria* of English botanists) is found plentifully on the sea-shores of England, Ireland, and Scotland, and in some foreign European, African, and American sea-coasts. The Dutch have used the bent long since on the loose soil of their coast, and made it instrumental in saving large tracts of now fertile land. In this country, at a later period, it would appear that attention was directed to the value of the sea-reed or bent, and particularly on the coast of Norfolk. Sand-banks were planted, and the seed of the bent sown along with the *Elymus arenaria*. We find the great utility of the bent was acknowledged in this country as far back as the reign of Elizabeth, and statutes were passed forbidding its exportation. The town of Newborough, in Anglesea, was at one time almost wholly supported by the manufacturing of the plant into mats and ropes, the long tough leaves rolled at the margin in such a way as to become cylindrical, the leaf being well adapted for the purpose. In the Gaelic or Irish language the sea-reed or bent is called *Murran*, and with the difference of a single letter in Norfolk and other places the plant is known as *Marran*, and the sand-banks on which it grows are called "marran banks." None but those who have some practical knowledge or experience of the uses to which the bent has been applied in the British Islands and in Holland in the past would think that this simple grass, even when unassisted with human skill, is capable of fastening or binding together the sand, and presenting a successful resistance or impediment to the encroachment of the sea. For long stretches of our sea-coast, the sand, by the continual action of the wind and tide, has in sundry places been drifted into enormous heaps, and in respect to the north-west and south-west of Ireland the accumulations have been most marked within the present century. At a distance these heaps of sand convey the appearance of a hilly country, and in stormy weather, when the wind blows leeward, the loose sand is drifted or blown in great quantity over adjacent land, ruining, decade after decade, thousands of acres. Upwards of fifty years ago the late Lord Palmerston, on one of his Irish estates, in the County Sligo, situated on Donegal Bay, carried out a successful experiment in planting the bent. At Liffoney, midway between Sligo and Ballyshannon, the district was of such a character as to test the value of the bent. Along the coast the sea set in heavily, and no headland here presented itself to break the fury of the storm blown across the broad Atlantic. The sand was covering great portions of valuable land when Lord Palmerston, to check the progress of encroachment, planted the sea-bent on a small promontory adjoining the harbour of Mullochmore. The more level sand-fields adjoining the seashore were, in the first instance, planted, and in consequence of not keeping sufficiently to the windward, the encroachment was not properly checked, and the planted spaces were repeatedly covered. The error of not fastening the sand to the windward was afterwards improved upon. It was determined to plant the young offsets promiscuously, at about 15 in. apart, rather than in rows, as in the latter way the sand accumulated very much between the drills. About the year 1832, 200 acres had already been planted with the bent-grass, and this surface was not only prevented from injuring adjoining land, but converted from a sterile and pathless waste to a verdant pasture. Many head of cattle in the summer months grazed where, a short time previously, was shifting sand and barrenness, and the bent-grass fulfilled then and since, as it would now elsewhere, the great uses for which it is so admirably adapted. The tenacity of the bent is truly wonderful; the roots extend in every possible direction and push up through many feet of sand, binding it together. It must, however, be remarked, that if rabbits are allowed unchecked to burrow under the bent-grass, the sand will, after a while, as the rabbits increase, be loosened, and be liable to be drifted before the wind. This has happened in some places; but apart from this danger, which can be controlled, the matted and net-work roots of the humble but valuable bent-grass are sufficient to resist the encroachments we have mentioned.

Long since was witnessed in the sister kingdom a scene almost realising the Sandy Desert of Arabia. The sands of Rosapenna, northwards of Dow Castle, were visited and described upwards of half a century ago by a racy topographical writer, but the scene of desolation still increased in wildness as the years moved on. Nothing was to be seen but one wide waste of red sand for miles, not a blade of grass, not a particle of verdure, "hills and dales and undulating swells, smooth solitary, desolate, reflecting the sun from their polished surfaces of one uniform and flesh-like hue." Now, a century since, the coast line of the district was a highly improved one, and was the much-ornamented estate of Lord Boyne. The mansion was a comfortable old-fashioned manorial house, with gardens laid out in the taste of the period, exhibiting avenues, terraces, hedges, and statues, surrounded with walled parks; in fact, the first residence of a nobleman, and the country around a great sheep-walk. Less than fifty years was sufficient to rub mansion, trees, garden, park, sheep-walk, and all that was bright, out of existence, and bury all in the sand. The spirit of the western ocean and the drifting sand pushed its conquest, and listless man retired defeated and dishonoured. The humble bent would have saved all had it received the small protection it needed, and verdure and plenty would have continued to smile where desolation has long reigned.

As regards embanking of the less ambitious and expensive form for the protection of roads or reclaimed land, a little may be said usefully. Compound slopes have been considered to possess these advantages in an embankment, that they are more effective, and that they lessen the expense of the original structure and its future repair. In the sister kingdom embankments for roads and reclaimed land are made with a steep slope, but when these walls give way it is seldom the face of the work goes first, the breakage beginning generally behind or near the top. The water that falls over, or upon, or lodges behind it, is mostly found to be the cause of the damage. Single sloped walls, it would appear, should be therefore very high, so that no extraordinary waves should have power to wash over them. Rough slopes are more effective than smooth ones in breaking the force of the wave; but, of course, in respect to sea-walls and piers alongside of which shipping has to come, the work must be smooth to a certain degree. Many piers and sea-walls, however, that have failed have been replaced with edge pitching, and we have witnessed in sundry places the coping of sea-walls or the roadway of

piers formed of stones pitched upon edge replacing the large flat blocks that were swept away by the action of the waves. In many situations it would be found practicable to use clay-work to, at least, half tide, as a combination of earthwork and stonework would lessen the expense of piers considerably. Half-tide embankments have been successfully used in Holland, for, except in very exposed situations, it is not necessary to breast more than the lower slope; that is, in cases where there are two or more slopes with a cess between them. The Dutch adopt, as a general rule, for half-tide embankments, an inner slope and top of bank covered with layers of clay 8 in. in thickness, and planted with grass; and the outer top slope and cess, with layers 12 in. thick, and sown with a mixture of salt mash, meadow grass, and clover seed; this being protected with a "crammat" until the grass has grown, which generally takes about three years. The lower slope has a layer of clay, 18 in. thick, protected either by fascines or stone work, but the former are preferred for several reasons. They are found to be less expensive, and because a foreshore forms outside the bank which covers up the stones, which are rendered useless. The Dutch engineers recommend fascines, too, for the protection of the bank in preference to stone, for these other additional reasons,—that the numerous stakes fastening down the fascines act similarly to the rough projections of the slates, and break the force of the waves. The protections of straw, called "crammats," which they use, act similarly to gravel and shingle, and their roughness, combined with their absorption, break the force of the waves. Mr. Henry Kinahan, M.R.I.A., in a paper read a few years ago, "On Piers and other Sea Walls," before the Civil Engineers of Ireland, said that he had seen masses of *alva marina* used similarly to protect a place in the bank the sea was breaching. Mr. Kinahan's paper, as a whole, will be found useful as a reference, both in regard to expensive forms of embanking, as well as more simple and far less expensive methods, and it otherwise affords some interesting facts concerning the peculiarities and practices indigenous to Ireland in the past, and to some extent still existing. The Dutch make their banks usually of sand or other materials ready to hand, necessitating the thick layer of clay. An old system that obtained in Ireland, nearly abandoned now, was to build a bank faced with faggots, and these seemed effective and cheap, as they prevented the slipping of the banks and the wave-wash while the work was being constructed. Faggots were used in some of the Irish banks for stopping the breaches where expensive piling failed. It is known that some of the Continental engineers use a combination of basket and fascines, *i.e.* faggots, to close the last opening in an embankment.

The rapid denudation that is taking place in several parts of our coasts might be stayed and much valuable land saved by the construction of groynes of an inexpensive kind. Various materials might be used to make groynes; wood, however, is commonly used, though in some localities stones, slaty or flaggy stones, would be cheaper and more effective if pitched on the edge and backed with sea-weed, gravel, and shingle. An effective groyne has been made more than once in the sister island, of sea-weed and straw "suggauns" to keep the sea out of the turf banks. The sea-weed was tied into bundles, and the suggauns run through the tyings as each was placed in position; the bundles, as placed, were weighted with sand, while the seaward end of the suggauns was weighted with stones. When the wall was of sufficient height it was then backed with sand, and the groyne was complete. A groyne of sea-weed of course suggests other vegetable growths and materials, such as faggots of whin, or furze, brushwood, old barrels, creosoted guano and other bags, with casks often wasted and unutilised. These, filled with sand, could be fastened in position by either chains or wires row after row, until a beach had accumulated to the height required. A backing could easily be procured, such as sea-weed, sand, gravel, drift, and other materials, this backing adding to the stability of the groyne previously to the beach beginning to accumulate. No certain rules can be laid down for the length, position, or number of groynes; for, as localities widely differ, set rules will not be found to answer. A few trials of experimental groynes will afford a useful test and will be the best way of finding out what is required in a doubtful situation.

There are several useful aquatic or water-plants growing on the margins of our rivers and lakes, and trees also, which have remarkable binding qualities through the nature of their roots, and they possess other useful properties besides. Among these are species of water-lilies, reeds, "flaggers," *i.e.*, flags, rushes, &c., and those trees of the willow order, including osiers and sallows. Though living and growing in damp situations, and often with their roots in the water, they take a deep and a firm hold, binding the earth with their roots though surrounded by water, or partly within and without that element. There is many a swamp that yields no return from one year's end to another, which might be profitably utilised by growing osiers and other plants with a marketable value.

The reclamation of land is a most important question, for it means some additional millions of acres put under cultivation, and greatly increased food supplies for man and beast, a vital question indeed that ought to be more seriously considered by the statesmen of our time. Where nature, then, can be enlisted to assist us in the work of land reclamation, her aid should be availed of to the fullest extent, and no opportunity lost in doing much good work with the materials to our hands. A large outlay of capital for the execution of ambitious schemes of engineering work can only be expected in a few places; but the work we have indicated can be performed successfully, little by little, and with advantage to the doers and the nation.

UNPREPARED,—AS USUAL.

PEOPLE who live in countries that are liable to shocks of earthquake usually endeavour to build their houses with some reference to such a visitation, avoiding tall buildings or massive and rigid materials, for instance, and preferring low habitations, principally of timber. If they deliberately built lofty houses of heavy masses of stone, which were certain to topple over and crush them at the periodical earthquake season, they would be regarded as very suicidal people, even if the chance of getting through an occasional season without an earthquake were taken into account.

Frost and snow are not such serious matters as earthquakes, certainly; but, considering the amount of inconvenience and distress they entail when coming suddenly and in force upon town and country, the stolidity with which we go on from year to year without making any definite or systematic effort to be prepared against these inconveniences is very remarkable. We know that we may, any winter, be subject to a severe frost of more or less duration; that when it is hardest it is also generally very sudden, and that it is difficult to predict, with any probability, how long it may last. Yet we actually behave as if such visitations as severe frost and snow were quite unexpected and unheard of in this climate.

As far as the country is concerned, of course, little or nothing can be done, in the case of a severe fall of drifting snow, except to endeavour as quickly as possible to get the railway communication clear. The railway companies, with their immense staffs, and their power, if properly employed, of organising labour and means, have exceptional advantages in dealing with the difficulty, and their interests so manifestly square with their duties in this particular that they may be generally trusted to use all their available means to effect a clearance as soon as possible. But while we have probably no reason to charge them with neglect in this respect, the conduct of some of the companies recently, in almost deliberately (for all we can see to the contrary) selling tickets and sending out whole train-loads of passengers on journeys when they must have had full intimation that the lines were blocked, and that they were only sending out passengers to the certain discomfort and misery of being detained for many hours on the road in this exceptionally severe weather, cannot be too strongly commented upon. The system adopted, apparently as a policy, or at all events as the result of the most culpable carelessness and indifference, of keeping passengers for an outgoing train quite in the dark as to the state of the line, and taking their money for a journey on which the company's officials know that they cannot be conveyed, is simply swindling, and not only that, for it is cruelty as well. Delicate women, and men who are not in rude health, may have to date premature death or irremediable injury to the constitution from the hardship and exposure to which some have evidently been, we must say, wantonly exposed. We hope that some of the victims who can best afford it will take up the case of the public against this selfish railway officialism, by bringing the matter to a legal test and reading some of the companies a practical lesson on that point.

But if we come from the country to the town, and take the principal town of the kingdom as an instance, we see a lamentable spectacle, in such weather as we have been experiencing, of apparently almost utter inability to foresee a difficulty and provide for it, and want of spirit and organisation to meet the circumstances when they do arise. The clearing of country roads, when blocked to any great extent, may be regarded as nearly an impossibility; the labour and means are not generally to be had, and the only thing is patience. But for a great town like London, full of labourers wanting work, and in which all the necessary appliances ought to be available, to be blockaded and rendered nearly impassable for vehicles for a whole week (up to the time of writing this), is really discreditable and quite unnecessary. The duty imposed by the law on householders of clearing the footway before their own property, seems in most parts of the town to have been fairly attended to. But we surely have equally a right to expect that the public bodies who represent the ratepayers in each division of the town should be bound to clear the streets, each in its own district. In the City considerable effort has been made in this way; and we learn that over 1,000 extra hands were employed for some days in clearing the roads and removing the snow; and as far as we have been able to observe, this effort has extended further eastward than the City. But in West London the state of things has been most discreditable. We have seen for a whole week the great thoroughfares and squares lined with heaps of snow, piled up and left to form a barrier between the footway and the carriageway, and the carriageway itself left covered to a formidable depth with snow, which, even under the present temperature, is slowly degenerating into mud, and which as soon as a thaw comes will transform the streets into ditches. And the most discreditable part of the matter is that the labour necessary for the removal is to be had in abundance, if any one, or any public bodies, had sufficient administrative ability and foresight to organise it. At the beginning of this week we had occasion to hear a good deal personally from some of those who represented the three large societies which, through the columns of the *Times*, undertook among them to provide for the relief of distress in the poorer districts of London, viz., the Charity Organisation Society, the Society for the Relief of Distress, and the Metropolitan Visiting and Relief Association. We learned from these gentlemen, clergymen and others engaged in practically carrying out the objects of the combined societies, that the distress was very great in East London from the stoppage of work, and that there was great difficulty in knowing how to meet the case, not so much from want of money, of which a good deal was forthcoming, as from the difficulty of applying it so as to render effectual service without rewarding mere idlers or demoralising and pauperising the population by indiscriminate charity, a result which it is well known has constantly followed the establishment of great special relief funds inconsiderately administered. Now the fact we wish to emphasise is that, during the past week or more, in East London there have been thousands of men of the poorer labouring class thrown out of work, wanting work, only too thankful if they could get it; there have been organised committees supplied with funds to at least a considerable extent, anxious to help those in distress, but in the greatest difficulty to see how to do it, and all this time there has been in West London useful work for hundreds, we may, indeed, say thousands, of people, work which the public would be thankful to see done, which public convenience actually calls for, and which has been all this while left undone. Money has been sent from the West to the East, which, if applied, must in some sense be applied rather as charity than as wages, a kind of application always carrying its evils with it; yet no one seems to have thought of bringing labour to the West, where it is wanted *pro tem.*, as much as money is wanted in the East. Let our public district representatives think about that aspect of affairs. Thousands of men at one end of a great city wanting work,—work for thousands

of men at the other end of the same city, and no one with head enough on his shoulders to put two and two together.

Among the less apparent and wholesale, but nevertheless among the very serious discomforts which might be avoided, is that of want of water from the freezing up of supply-pipes; a deprivation entailing not only the greatest discomfort, but also, in many cases, operating very injuriously to health. Yet all this might be prevented if we did not lay on our service-pipes, or allow others to lay them on, as if there were no such thing as frost. The water companies, we take it, must share a large portion of the discredit for this evil. They ought to see that up to the outside of the houses service-pipes are laid so as to be secure from frost, either by being sufficiently deep in the ground, or by being cased in a rough casing with straw lining, where circumstances render it necessary that a pipe should come to the outer air before it enters the house. Inside the house it is a matter for the tenants. Provided the pipe is right outside, a small gas-jet where it enters the house (which is usually at some otherwise cold and unused corner) would do the job. Those who have suffered and are suffering from this deprivation of one of the chief necessaries of healthy life should make a note of it and endeavour so to arrange that they shall not be subject to it again. There is no real difficulty in the matter. The difficulty merely arises from the fact that most people never think about frost till it comes, and then they are almost indignant at their weak points being found out. Wherever we go we hear the same story of short allowance of water and its consequent discomforts. In the house in which we are writing we have not experienced the slightest impediment in the water-supply or in the usual working of waterclosets, &c., during a week or more of severe frost; and no one else need experience such discomfort if he will take precautions against it* beforehand instead of waiting till the frost comes to find it out.

The question what to do with all our unusual accession of snow, supposing it removed from the streets, is of course one of some difficulty; and here, again, we have to note the mistake of procrastinating experiments on this head until the evil is actually upon us. Means were suggested and partially tried some time ago for artificially melting snow so as to run it off economically into the sewers or the river, and if these had been tried and perfected during some light falls of snow in previous years we should now know what to do. But the experiment has now to be tried, and its success or otherwise ascertained, just when we want to deal with the matter quickly and with certainty. The moral is, look ahead and be prepared for emergencies before they arise. No place suffers so much as a great city, when the weather does get the better of its machinery, because the machine is so big and complicated that the slightest clog to its working produces very serious effects. But no place has such large resources against atmospheric surprises as a great city has or should have, if only they are rendered properly available.

"Sanitary Science in its Relation to Civil Architecture."—Mr. Ernest Turner, F.R.I.B.A., in a communication which from want of time was not read during the discussion on this subject at the Royal Institute of British Architects last week, wrote,—"In furtherance of the study of sanitary science, I shall have much pleasure in placing at the disposal of the Council of the Institute a silver medal to be competed for in 1882, and suggest that it be awarded to the candidate who obtains the greatest number of marks in sanitary subjects at the first compulsory examination. I leave this, however, entirely in the hands of the Council to determine."——Mr. J. Wallace Peggs, C.E., writes:—"In your excellent report of the discussion which took place at the Royal Institute of British Architects on Monday, 17th inst., on the paper 'Sanitary Science in its Relation to Civil Architecture,' I am reported to have said as follows:—'Professor James Thompson very early, about 1866, disconnected the soil-pipe of his own house and delivered it into a street gully. (?)' This should have been 'delivered into an *ordinary* gully.'"

* The placing of the cisterns in many London houses, practically, in the outer air, is of course a source of increased difficulty in regard to this evil. The cisterns should be under cover of a good roof, and with some means of slightly warming the air where they are placed, in cases of very sharp frost.

THE NEW COMMANDMENT: "THOU SHALT NOT WORK."

THE month of January, 1881, will long be memorable for the fury with which a late winter has descended upon England. The daily papers are full of the same kind of news from all parts of the country. Low temperature, terrific gales from the east, persistent and blinding snow, the fine granulation of which is no obstacle to its forming drifts of as much as 16 ft. in depth, constitute the staple of the reports. Hail-storms have beaten on the Yorkshire coast; but the greatest intensity of the cold has been experienced in the usually temperate districts of Devon, Cornwall, Somerset, and South Wales, a fact that denotes the southward movement of ice-floes in the Atlantic. Sensational writers in the Press are making things pleasant to their readers by speculations as to geological changes, and the possible return of the glacial period, in which lucubrations they evince unusual audacity in the use they make of half-comprehended scientific terms. In a word, a Russian winter has come upon us unprepared, and so much suffering has not been caused in England by the fury of the elements within the memory of the present generation.

The outburst of this Arctic storm has coincided, in point of time, with a prohibition issued by the trade-unions to about one-tenth part of the colliers of the United Kingdom against going to work in the pits. We desire to speak on the subject with perfect candour and impartiality. How deep a personal interest every Londoner will find involved in the question, we cannot tell at the time of writing. The arrest laid by the mighty hand of Nature on the works of man is so far more peremptory than are the orders of a trade-union, that public attention is at this moment riveted on the physical, rather than on the moral, difficulties of the situation. But the last notice that reached us of the movement of the coal market before the setting in of the snow-storm was to the effect that small coal, used for manufacturing purposes, had advanced in price, in some districts, from 1s. 6d. to 10s. per ton,—that is, had become sevenfold its former price. How far this may be taken as a guide to other changes may possibly become apparent before we go to press.

In times when war was the normal state of national relations, the fury of winter was ordinarily so far respected as to ensure a temporary truce. Troops went into winter quarters. In some cases such a procedure is involuntary. Napoleon Bonaparte, a man who considered that his own will was to regulate the action of Europe, was reduced to inactivity by a German winter, before he provoked the fury of a Russian climate. In the earlier times of Louis XIV., the retirement of the troops of the Grand Monarch into winter quarters had something of the aspect of leaving Paris for the season, or of any of the local migrations presented by fashion. Whether necessary or not, however, the rule was ordinarily followed, and may be taken as one of the immemorial traditions of the art of war.

It is thus worthy of attentive remark that the instigators of what almost partakes of the character of a civil war,—those who set class against class,—the hands against the heads,—the workers against the providers of work,—have selected a time so severe for the commencement of a campaign intended to be decisive. It is our profound conviction, as our readers are aware, that the true interest of every industry is comprehensive and compact. We deny that there can be any conflict between the true interests of labour and of capital, rightly understood. At the same time, it is impossible to deny that this view is not universally held. More than that, questions may and do from time to time arise as to which different views may be entertained, and to decide which contests from time to time take place that will not be avoided merely by being deplored. We are not, therefore, at the moment, denying the abstract right of any body of workmen to discontinue work if they are dissatisfied with the terms on which it is offered them. And, such being the case, we cannot condemn the selection of such times as may seem best suited, by either party, to enforce their demand. War itself,—we speak of the war of man and master,—we hold to be a costly and miserable folly. But if this war be entered on, it has its own hard rules. It is not to be fought with rose water. Nor have the unions any hand,—so far as we can trace the connexion between human and elemental action,—in intensifying the rigours of this particular winter. At the same time, the severity of the season will no doubt lead to a very severe scrutiny, both of the motives and of the intelligence of the advisers, or rather the compellers, of a strike at such a season, on the part of large masses of the public, who ordinarily pay but little heed to "trade disputes." That, perhaps, is not altogether an evil. Altogether an evil, though, is the unprecedented amount of suffering to which we fear that at this moment the wives and children of the Lancashire colliers, to say nothing of that respectable body of stalwart workmen themselves, are exposed by the orders of the union, reversing in many instances the decisions arrived at by the miners themselves.

Public attention, we have said, is tolerably sure to be riveted on the present contest in an unusual manner. It is very well that this should be the case. For although in some places the never-closed sore of local contest as to the rate of wages has been referred to as a cause of strikes, such is not the matter that is really at stake. The reason why 50,000 coal-miners are ordered to be idle in the severest winter they have ever known is quite apart from the rate of wages paid in one or another district. It is a movement that is distinctly political. It is the resolve of the union to prevent the men from making arrangements by which they should, as it is called, "contract themselves out of the operations of the Employers' Liability Act of last session." This is a subject on which such violence has been shown, and such measures have been taken, to prevent any free action on the part of the persons directly interested, that we hope we shall be doing public service by looking a little closely at the main facts of the case.

In the year 1879, 476,810 persons were employed in the collieries of Great Britain. This shows a falling off since 1875, when the number of men employed was returned at 525,843. For the sake of the inquiry into which we are about to enter, we will take the round number of 500,000 colliers. We may observe, in passing, that the productive value of the collier's labour, which for years was steadily on the decline, has risen in the year 1879; the rate being 284 tons of coal raised per workman. This is still ten per cent. below the industrial energy of the collier in 1871, but it is eight per cent. more than his duty value in 1874. The fatal injuries sustained in collieries in 1879 were 1,037. This was a diminution of 453 as compared with the preceding year. Taking round numbers, which every one can correct for himself, we put the deaths at 1,000, or 1 for every 500 persons employed. Out of this 1,000, according to the average of a large number of years, 330 deaths are occasioned by falls of coal or of roof; 200 are caused by explosions; 150 are due to shaft accidents; and 320 are attributable to miscellaneous causes.

The provisions of the Employers' Liability Act of last session so far throw on the masters the onus of casualties in the mines, that they abolish the former plea of "common employment." We are not now about to express any opinion upon the policy or the efficiency of the measure; we look only at the law as it stands. The result of that is, that if in any case of casualty it can be proved that the mischief was due to any negligence on the part of the master, or of his authorised agents, compensation shall be made to the sufferers or their representatives. Such compensation, however, is in no case to exceed the amount of three years' wages. Whether this maximum sum is to be calculated at three years of 313 full days each, or at the average number of days actually worked, and whether any deduction is to be made for the cost of the maintenance of the workman himself for those three years, are questions on which it would be idle for any one to offer an opinion before the matter has been fought out in a court of justice.

We have, then, three things necessary to establish any claim on the proprietors of a mine in the case of a man killed on his works. Negligence on the part of proprietor or authorised servant must be shown, to the satisfaction of a jury, to have produced the accident. This involves, first, proof of the negligence, and secondly proof of the agency. Third, is the limit of maximum damages, which, for the reasons hinted above, we can hardly estimate at more than 200*l.* in each case. Such would be the outside to be obtained by those who take the advice not to contract themselves out of the Employers' Liability Act.

Accidents from negligence are otherwise to be called preventible accidents, and the prevention, in order to throw the blame on the master, must be shown to have failed from his fault, not from that of the sufferers. Thus in the case of the largest class of accidents—those from fall of coal or roof—the cases would be very rare in which the master or the foreman could be considered to have anything to do with them. Of course, if a mine were carried on without a proper supply of timber, negligence would be shown; although even then the question would have to go to the jury how far the miner was justified in going to work without a proper supply of timber. So, again, as to shaft accidents. These have occurred from the breaking of a rope too much worn; from the failure of the engine, or from some part of the administration of the mine. But in the great majority of cases of this kind the plea of the injury of the workman from causes beyond his own control, but which ought to be within the control of the master, could not for a moment apply. And so as to the miscellaneous causes. The chief preventible causes of death, as they are generally regarded, are the explosions. In all cases of explosion the question of ventilation is raised; and the absence of efficient ventilation would be a clear case of negligence within the meaning of the Act of Parliament.

But here, again, comes in a remark which we have not unfrequently been compelled to make before. The great majority of cases of explosion have been traced, not to the negligence of the masters, but to the want of obedience of the men to necessary rules. We have recently shown how very much apology is to be made for the man working under the terrible pressure of the darkness of the mine. How natural,—how almost unavoidable, it is for the miner, if anxious about roof or props, to take any steps in his power to obtain more light than is given by the feeble ray of the "Davy" or the "Geordie." But, if that be confessed, it is not redressed. We may have a large amount of sympathy with the man who, opening his safety-lamp to look at his polling-boards more carefully, sets fire to a blower, and explodes a mine. But the matter with which we now have to do is,—that the master is in no way responsible for these catastrophes. And as far as the recollection of very careful attention given to the details of mine explosions for the last fifteen years goes, the cases are very few indeed in which any impartial jury would have thrown blame on the master. In point of fact, though the old plea of common employment would have prevented the recovery of damages in these cases, it would not have stood in the way of a charge of manslaughter, which would probably have been preferred if there had been any chance of proving such a degree of negligence as would require to be proven in order now to obtain a verdict under the new Act.

Now as out of the main class of preventible casualties, that of explosions, amounting to 200 per annum, only a small portion could, with any probability, be laid on the shoulders of the masters, it is clear that but very few out of the annual 1,000 deaths could be shown, or even attempted to be shown, to have resulted from their negligence. For the sake of argument, we will suppose that 250 deaths per annum, or one-fourth of all the deaths in the year, can be traced to negligence on the part of masters or their agents. Then the sum of 50,000*l.* per annum would be the utmost that the representatives of the men could expect in any one year to extract from the masters, on the system of refusing any form of agreement, and fighting every claim to the utmost.

It must be remarked that the adoption of this line of conduct by the men, especially when not wished for by themselves, but enforced by the orders of their unions, would throw on the masters the necessity of self-defence. If 50,000*l.* per year were the sum for which they might become liable under the provisions of this Act, the natural course would be to raise that sum at once by subscription, to form a common defence fund, and to follow the lead of the union by fighting every single claim. And the first few trials would so clearly show what judges and juries would regard as such negligence as would render the masters liable, that we may be quite sure precautions would at once be adopted, not so much for the safety of the men, as for that of the masters. The effect of the introduction of such a principle of conduct in all underground work would be, we venture to think, disastrous. If, after a year or two, 10,000*l.* a year for widows and orphans were extracted from the masters by appeals to the tribunals, it would be something extraordinary. This, then, is about the outside of the advantage for which the men are counselled to fight.

We may add a word or two as to compensation for casualties not fatal. We are not aware of the collection of any statistics on this head. We will, therefore, take the rate of casualties in war for a guide. There are, we believe, between four and five wounded to one killed. The larger ratio would give 5,000 minor casualties. A broken limb, under favourable circumstances, may be cured in six weeks. Thus, if we allow six weeks' pay, or say 9*l.*, for each of the contingent 5,000 minor accidents, we have an outside of 45,000*l.* to add to our former maximum of 50,000*l.* We need not recur to the argument against the enforcement of the maximum rate, but mention these figures only in order to show that we have not lost sight of the contingencies of minor casualties.

Now for the other side. Under that kind of relation of which, years ago, we had ample experience, between master and men (when the word "master" was used as almost a term of endearment), each of the 500,000 colliers would pay 3d. a week to the sick fund, sickness, of course, including all kinds of casualty. That easily-collected contribution,—the value of a pot of beer per head,—would amount to 325,000*l.* per annum. To this the masters would add an equal amount, bringing up the annual providence fund to 650,000*l.* per annum. Here there is no fighting, no lawyers' bills, no delay. The 1,000 fatal casualties are at once met,—not the 250 alone for which fight might be made,—by a ready fund. That calls for 200,000*l.* a year. If we set down the minor casualties as in the same ratio as before allowed, we have a further call for 180,000*l.* This makes 380,000*l.* per annum. We have thus a surplus (except in the case of unusual catastrophe), of 270,000*l.* per annum to form a fund, which, in three or four years, would reach the respectable figure of a million sterling. Out of this, not only would all kinds of distress among the subscribers be easily and liberally met, but the means of providing for the permanent welfare of the whole, indirectly, would be secured. We can conceive of no nobler institution,—of no case in which, out of very small subscriptions, punctually paid, could be raised so magnificent a provision for the comfort of the widow, the orphan, the maimed, and the sick.

HAYDON AND THE ELGIN MARBLES.

A REFLECTION which afforded the enthusiastic historical painter, Benjamin Haydon, the greatest satisfaction amid his many misfortunes, was the part he had taken in securing for the British nation the Elgin marbles. It was not at the time acknowledged, nor was there any mention made of him in the published accounts of the proceedings of the Parliamentary Committee on the question of whether they should be so acquired. The Devonshire artist was too free-spoken for the authorities. They were afraid of him, and so kept him at arm's length. They avoided calling him as a witness before the Commission on the subject, nor did his name appear in connexion with it. And yet, in as far as he was the first to boldly assert the value of these marbles, and persistently throughout advocated their purchase by the nation, he had a fair claim to recognition.

In his lectures he gives some account of his first impression on seeing these grand relics of the work of Phidias and his school, and tells how, when they were first brought over by Lord Elgin, they were deposited where they could not be adequately seen; and yet, how, in spite of these disadvantages, he made himself acquainted with their beauties. "I studied them," he says, "night after night, by candle and lamp light, where they rested in a damp and dusty penthouse." To attract attention and respect to the superiority of Phidias he accumulated evidence from the passages of ancient authors. As, for example, from Cicero, who says, "Nothing is more perfect than Phidias." "You cannot praise him enough," says Pliny. "He made gods better than men," says Quintilian. "Phidias was skilful in beauty," says Plato. And, in addition, he mentioned how Plutarch describes the awe with which Æmilius, the Roman general, was struck when he first contemplated the statue of the Olympian Jupiter! Thus did this enthusiastic artist and lover of art, beset as he was with worldly difficulties, labour for its best interests, and for those of the nation, in the acquirement for England of these invaluable relics of the best period of Greek sculpture.

They were bought,—and in his lecture he pardonably sings a song of triumph thereon, and if on that occasion he did not put his light under a bushel, he may find some excuse in his having found others so ready to perform that operation for him. "Directly," he says, "on seeing the Elgin marbles, it was my lot to feel their future in an instant, and what I asserted of their enormous superiority, and future influence, eight years afterwards Canova confirmed." And he follows with, "I have lived to see the benefit and glory of these immortal productions. I have lived to see them purchased by an English Parliament, and visited by illustrious foreigners to study their principles." It may be added that if his life had been continued until now, he would have seen the opinion he had from the first expressed of them, year by year only the more fully endorsed by the judgment of professors of art and the high estimation in which they are universally held.

To the remarks which appeared in these columns, about this time last year, on "some characteristics" displayed by these noble relics of Greek sculpture, no notice was appended of the part which Haydon had in their being acquired for the nation. Now, however, in supplying this omission, we will take the opportunity of calling attention to the really great works of his own, in the sister art of historical painting, which were produced, under many adverse circumstances, by this enthusiastic artist, imprudent no doubt, but generous to a fault. Just at present the public seems to have forgotten them, so that it may be serviceable to remind it of their existence, and that, in the history, and among the treasures, of native art, they should not be lost sight of; and, moreover, that the exhibition of a collection of them in London, perhaps within the year just begun, would be but timely.

Among those works of his which readily occur to the memory of those of mature age, are the two magnificent pictures of "The Judgment of Solomon" and of the "Raising of Lazarus," in which last the representation of him who was just restored to life is one of the most thrilling and impressive figures in the world, far more so than the version to be seen in the famed picture in our National Gallery of the same subject by Sebastian del Piombo. Also, in the costume and surroundings of modern life, the "Napoleon at St. Helena," and the "Waiting for the *Times*," are works full of truth and excellent character. The paintings of another enthusiastic artist, James Barry, at the Society of Arts, have lately been justly brought prominently before the public by the attention which has been drawn to them by their being suitably cleaned and restored, and by the interesting description of them from the pen of the secretary of that valuable institution, not to mention the account previously given of them in our own pages. These works have the advantage of being together; those of Haydon are dispersed. The rooms of the Society of Arts are otherwise occupied possibly, but, in that case, some other suitable accommodation might doubtless be found for a collection of Haydon's pictures, where the opportunity of seeing them would be a boon and a gratification to the public. The Council of the Albert Hall, for example, might be led to get them together for their forthcoming Exhibition of Works of Fine Art, proposed to be opened in May next.

Haydon was no common man. Even if, in the criticism of his contemporaneous brother artists, occasionally severe and unjust, he did not rise to the highest level of an historical painter, yet, at any rate, he only missed it by a hair's breadth, and that, not through any deficiency of genius, but rather from a want of that patient study which he inculcated in his advice to others. Neither, in the interests of art generally, should it be lost sight of how much he laboured for it, and how much he actually did for it. No small part had his persistent eloquence and energetic appeals to the Government and the public, during a series of years, in leading to the eventual appointment of the Royal Commission for the Encouragement of the Fine Arts in the rebuilding of the Houses of Parliament, which was so intelligently and generously presided over by the Prince Consort, and has borne some excellent fruits; and all this is not to be less thought of, but, surely, should be sympathetically, the more so,

because, as it happened most unfortunately in the issue, the advantage of his efforts eventually accrued wholly to others, and to the nation, and, alas! in no degree to himself.

LAMBETH UNDER WATER AGAIN, AND HOW TO PREVENT SUCH A CALAMITY.

IN writing the other day of preventible causes of human misery, we omitted one which, while strictly local in its incidence, is in other respects probably more inexcusable than any of those to which we referred. We allude to the extreme of misery, involving loss of property, personal suffering, and injury to health, which has been experienced by many inhabitants of South London at the very time when they were least able to resist the shock. The sudden arrival of an unusual snowstorm, together with fierce east wind and low temperature, has been itself a trial to many a hale and hearty man. What is it, then, to the women and children who have been turned out without a minute's notice to face it, turned out by the neglected and outraged river, which was once the pride and glory of London?

It is not for us to attempt to indicate where the blame lies. But that some one must be to blame for the wanton and persistent neglect, in spite of warnings chronicled in our own pages, which has wrought such terrible calamity, we cannot doubt. It is not as if any new thing had happened. It is true that the height attained by the river Thames on the 18th current was one hardly to have been expected on that particular day. But it might have been regarded as far from impossible a tide or two before it really occurred, a little nearer to the full of the moon. It was not an unprecedented rise. So far from that, according to published accounts, it was some 6 in. lower than a flood that occurred in November, 1875. On that occasion we entered at some length into the subject, pointing out the means by which safety might for the future be ensured. On not a few subsequent occasions we have called attention to the gradual change which is occurring in the Thames, a change to the advantage of the river as a navigable channel, but calling for certain precautions as to the riverain residential property. Alas, it has been of no use! It takes repeated shocks to stir the English public. When stirred, no doubt, it goes to work with a will; but it is too often the case that warnings are neglected, and that something worse than warning has to recur before those steps are taken which, if taken in the first instance, would have prevented much suffering and loss.

It ought to be now well known that a spring-tide may, at any time, occur in London with a rise far above that pointed out as due in the tables of the Admiralty. This fact is in full evidence. It has been brought before the Institution of Civil Engineers. It has been brought before the Select Committee on the Thames Floods Prevention Bill. By the term Trinity high-water mark we indicate the height which was reached by the flood-tide of the Thames at the commencement of the century. This height allowed for a range of 20 ft. or thereabouts between highest ebb and lowest flood. But within the last five years the tide has been known to ebb to 3 ft. 2 in. below, and to rise to 4 ft. 7 in. above, the 20 ft. range. In fact, it has attained a maximum range of 27 ft. 9 in. instead of an inch or so over 20 ft. And these extraordinarily high and low registers are on the increase, both in number and in dimension. The flood of the 18th instant was by no means the highest hitherto attained. It was, as far as we can tell, some 6 in. less in height than those that may possibly occur on the 17th or the 31st of next March, or on the 16th of next April; or, indeed, as this experience shows, at any spring-tide when there is a violent wind driving the flood-wave up the river.

As to the measures to be taken for the protection of London from this fearful calamity, no engineer of any eminence can have any doubt. The only difficulties that have opposed the proper protection of the low-lying districts are administrative,—not mechanical, or, rather, hydraulic. Into that we have entered before. We do not know that we can do much good by going over the ground again. Unless a sufficient amount of public indignation be excited by the recent misery to make the Metropolitan Board, or whoever may be the proper authority, exert itself, the voice of the press will be neglected. And, if that indignation arise, it will find its own channels of utterance.

We confine ourselves, therefore, to the thankless duty of pointing out a manner of enabling South London to take care of itself. In the present state of the quay walls and other defences of the river it is possible to prevent overflow at a given height, if sufficient warning can be given. On the last occasion on which flood was anticipated, men were in readiness with planking, clay, and other materials to raise those 10 in. or 20 in. of dam at the low parts of the quay walls which would be enough to keep out the tide. The mode, no doubt, is clumsy; but it may be made effective. The fear is, that the cry of "Wolf" may be raised so often, that when the wolf comes, as it did with a vengeance on the 18th inst., no one may be on the look out. And it is pretty clear that all theoretic warnings, such as so often make their appearance in the newspapers, only tend to confuse the minds of those to whom they are addressed, and thus to render prompt action in real time of need more difficult.

But it is perfectly easy to give a notice of from two to two hours and a half of a coming flood. Such a notice, if all things are kept in due readiness, would be ample for the protection of Lambeth. It is but the crest of the tide against which it is necessary to erect a barrier. When the crest once breaks over the bank, it soon makes a breach through which the river itself may rush; but the difference between safety and danger lies within a few inches, and a timely barrowful of clay may save a city from flood.

What is requisite is to erect one of those instruments which the Italians call hydrometers, or fluviometers, and which we call tide gauges, at a proper spot near Sheerness. We know already approximately to what height a tide will rise at London that has attained a certain height at Sheerness. A series of observations of the heights of tide at the Sheerness hydrometer and at London Bridge, together with records of the force and direction of the wind, and of the height of the barometer, would enable us to predict with extreme accuracy the movement of every tidal wave. A danger mark would then be drawn on the Sheerness hydrometer. It would be only necessary to watch this line at certain tides, as near the neaps the danger would not occur. The moment the danger line at Sheerness was touched by the flood tide, telegraphic news should be despatched to a station provided in London. News would immediately be sent to the spots where danger is known to exist, and to those where the means of temporary defence are in readiness, and Lambeth need never again be under water.

If the funds already collected for the relief of those suffering from inundation be insufficient for or inapplicable to, a prevention that would be better than any kind of cure, we beg to suggest that a public subscription should be made in order to provide a warning tide-gauge at Sheerness. The method has for some time been in use on the Po, and terrible misfortunes have thus in several instances been avoided. The remedy is simple. But so is the evil. None the less is the latter one involving cruel disaster. It is a disaster wholly preventible, and one which, at the next equinoxial spring, may recur if the measure we recommend be not at once adopted, pending the execution of those permanent works of protection which ought to be at once taken in hand.

Since the above was in the printers' hands, it has been stated at the Metropolitan Board of Works that the flood of the 20th January rose 8 inches higher than on any previous occasion. If this be the case, it is a strong comment on our statement that the tidal range is on the increase; and only renders more imperative the erection of a warning tide-gauge.

ARCHITECTS AND SANITATION.

ARCHITECTS seem to be just now unmistakeably manifesting their interest in sanitary science. The number of those who attended the reading of Mr. Robins's comprehensive paper on the subject at the Institute, a month ago, and the number of those who attended the adjourned discussion, and followed it with keen attention, was a significant indication that the importance of that branch of science and practice is better understood than it was.

Another and a very practical proof has been given by the co-operation of architects in the establishment of the Sanitary Assurance Association. In the *Builder* an account was given of the public meeting at which this Association was definitely started, though it had been for some time previously in course of formation. Since then the articles of association, which have received the provisional approval of the Board of Trade, have been settled, and one of their provisions is that the executive council, which consists of eight members, shall always include not fewer than two architects, as well as two medical men. The honorary council,—a body comprising many men of distinction,—includes the names of well-known architects, and, in fact, this association, aiming as it does to improve the sanitary condition of the dwelling-houses of London, proposes, to a large extent, to reach them by the help of those who are professionally connected with them, and concerned for their owners,—the architects of London.

Of course, to a certain extent, the work which this Association and the kindred society which has been since brought before the public propose to do, is work which many architects are, from time to time, called to do for private clients, in the way of setting right the drainage of old houses, and which all are bound to do in planning the drainage, &c., of new buildings; and it is not proposed or supposed that architects should, or would send their own clients to the surveyor of a public body in preference to doing the work themselves. But many cases arise in which, from various causes, an architect would prefer to recommend a specialist to set to rights defective drains, just as a specialist is often called in to arrange hot-water apparatus and even ventilation. Many cases also occur in which an architect can require sanitary improvements, and cannot possibly design or superintend them. For example, on leasehold estates the time is now come when, in connexion with renewals, and even original lettings, the professional man having the care of the property may most reasonably require the houses to be so built,—or, if old ones, so altered,—as to be satisfactory in their sanitary arrangements. In such a case as this, and in many parallel cases, a Sanitary Assurance Association will offer the means of obtaining, at a moderate and definite expense, a specification of the defects,—where defects exist,—and of the work to be done to remedy these, an inspection of the work accomplished, and a certificate of the condition of the building.

It has been intended, as far as possible, to bring architects and medical men together in the inception and carrying out of this undertaking; and it is not too much to ask that the architectural profession, and the many surveyors, builders, owners of house-property, and others, who are accustomed to trust architects in their dealings with their property, should give attentive consideration to the proposals of the promoters of the Sanitary Assurance Association, as being intended, to a large extent, to represent architects in the great struggle now going on to secure some improvement in the sanitary condition of this great metropolis.

THE INSTITUTION OF CIVIL ENGINEERS AND THE WELFARE OF LONDON.

A POWERFUL auxiliary now offers its aid to the various associations and individuals who are engaged in the conflict, to which we referred in our last number, with preventible evils. The Institution of Civil Engineers commands an annual sum of above 400*l.*, provided for the encouragement of essays on professional matters. Among the subjects which they have proposed for the ensuing session are several that bear directly on the removal of some of the chief causes of distress that have been so prevalent of late. Among these are "the measures hitherto taken, and still necessary, for the relief of the Midland and Eastern counties of England from floods," and "the prevention of smoke from furnaces and domestic fireplaces." We rejoice to see these two timely notices. It will be remembered that not only are they calculated to elicit the best practical information attainable on the subject in the form of essay,—for every good essay will receive a premium,—but that, in case of any noteworthy communication being received, there is pretty sure to be a debate on the subject, in which all the experience of members present will be represented.

At the same time, we mark with regret the statement of the Council that there has been a falling off from the standard of papers received

from students, insomuch that out of the fifty papers last sent in, it has been necessary absolutely to reject sixteen, while of the remaining thirty-four, twenty only have merited recognition.

It is probably owing to this that we observe the re-appearance, in the list of subjects, of not a few that were proposed last year. Among them is "The Resistance of Traction of Vehicles on Roads," which we are happy to see now accompanied by "The Comparative Cost of Transport by Land and by Water," a subject to the urgent importance of which we called attention on the occasion of the last report. The flow of water through pipes and conduits, the mechanical separation and chemical treatment of sewage, the modes of regulating storm-overflow from sewers, and the flushing of sewers, the methods used for determining the discharge of rivers, the works carried out on the Continent of Europe for the improvement of rivers, and of inland navigation, the construction of tide gauges and the mode of making tidal observations, the best mode of testing steam-engines, the use of compressed air as a motor power, the loss of power by friction, the value of different classes of lubricants, the methods of working deep coal-mines, coal depôts for ocean steamers, the methods of securing mineral workings, the management of underground water in mines, and the employment of the electric current for the transmission of sound, are among the subjects proposed now, in repetition of their proposal last year. It must be admitted that the field is large. But when we observe that the number of members of all classes on the books has risen from 2,960 last year to 3,082 in the present year, we can hardly doubt that much valuable professional information will be elicited by the appeal of the Council. There is ample scope for records of the experience of the engineer in widely differing parts of the field of his exertions. If we insist on the special value of the three subjects of the regulation of floods, the prevention of smoke, and the determination of the cost of different descriptions of traffic, it is because we feel these points to be not only subjects demanding the highest professional skill and experience in their treatment, but because they more intimately affect the life and health of London than almost anything in the list, unless we except the treatment of sewage.

ON THE WALLS OF OUR ROOMS.

IN artistic matters as well as in political, there is always a tendency to rush from one extreme to another. This is, however, more excusable in the latter than in the former sphere, because art is based on fixed principles, whilst politics are concerned with changing circumstances and events. At the present time the tendency in all matters which are concerned with houses is to rush into the opposite extreme to that which prevailed a certain number of years ago. There is a preference for beauty, or what is supposed to be beauty, to utility without a due appreciation of artistic principles or practical requirements. This in a small way is exemplified by the silly fashion of having small panes of glass placed in new houses built after old-fashioned models. We have nothing, of course, to say against houses designed with a view to please the eye, but it would be amusing if it were not sad to see how small is the true appreciation of propriety or even of beauty when such an admirable production as that of modern plate glass in large sheets is discarded for bottle-green panes a few inches in diameter. Internally, again, the same want of a steady regard to artistic principles is visible, and a tendency to be run away with by a vague impression that certain fashions which some artistic people happen to have adopted are necessarily desirable. It is in consequence of this weak-headedness that so many persons cover their walls with plates and dishes of china. Obviously the proper place for a plate or dish is on a table, and obviously also its primary object is utility. This utility consists of being placed on a table to hold certain things, and no plate or dish was ever intended to be hung on the wall of a drawing-room, certainly not in regular sets up to the soup-tureen, as may be seen in some houses. We are not, let it be noted, in any way protesting against vases or even pieces of domestic ware being placed on tables or shelves in moderation where their colour, if they have a colour, helps to light up a room, or where some delicate painting on them may be carefully observed. But domestic china, as a rule, is not fit to adorn a wall. It possesses no beauty of form, nor the breadth of colour and design to permit it to compete with pictures. An exception may be made in favour of the genuine Wedgwood ware, with the designs by Flaxman, and the competent artists who were employed by Josiah Wedgwood and Bentley; and be it noted how thoroughly these able men understood their business, for such china as they intended should decorate the walls of rooms was issued from the Staffordshire potteries in the form of plaques or medallions. Therefore we hope that all sensible decorators, whether they be professionals or amateurs, will take care to inform any so-called "high art" person who may wish for their advice that the decoration of walls with domestic china is inartistic. It is, in fact, only the swing of the pendulum in the opposite direction to which it rushed fifty years ago.

Moreover, we entertain great doubt whether persons who have to consider the decoration of rooms sufficiently regard the functions of walls. A wall must, generally speaking, be a mere background, and therefore it must be decorated as far as possible in such a way as to throw up the foreground. In some sense pictures must be considered a part of the foreground, and therefore where the owner of a house possesses pictures worth looking at, the object of the decorator should be, as far as possible, to make the wall so negative in character as not to attract the eye, but to allow it to be attracted by the pictures, the ornaments, and the people. Hence, where there are pictures, large patterned papers or papers of any kind are undesirable, and a wall painted or distempered green, buff, or gray in such shades as may be best suited to the situation of the house, is to be preferred. Elaborate patterns broken by pictures bring the reverse of harmony into a room, and if statuary, whether in the shape of marbles or bronzes, be part of the ornaments of a room, a patterned paper is very fatal to all good effects, and quite puts an end to the simplicity and dignity of sculpture. But undoubtedly, if a room is not adorned with pictures or graceful ornaments, then some kind of pattern on a paper may be desirable to break the monotony of a blank wall, but no one who has noticed the effects of flowers or ferns against a plain green or gray wall can fail to see how infinitely preferable is an unpatterned wall for bringing out the beauty of natural or artificial objects. In these days, when engravings and etchings are within the reach of most, not to speak of autotypes and other reproductions, we are inclined to believe that in entertaining-rooms, as they are called, the day for patterned papers has passed. In bed-rooms it may be different; neatness and the appearance of comfort may be given by light and sensible-patterned papers, conventionalising as far as possible natural objects, which are always graceful, rather than artificial patterns, which are generally quite the reverse.

Again, in bed-rooms, generally speaking, the occupant does not spend the amount of time which he does in a drawing-room or library, and therefore it is obviously desirable that, in these latter rooms, he should not always have before him on all sides a pattern staring him in the face which it is quite impossible can ever be "a thing of beauty" or "a joy for ever." It will, indeed, like the thing of beauty of which Keats wrote, "never pass into nothingness," but when we look round scores of drawing-rooms, how much do we desire that a monotonous lozenge or a stiff *fleur-de-lis* would entirely disappear from our view. Far better is the plain and simple wall on which the eye rests with refreshment till it glances to the water-colour of the summer sea or the misty mountain, whilst in graceful form below stand out the graceful flowers, all

> "Full of sweet dreams, and health and quiet breathing,"

to quote again the words of the same youthful poet.

It is our walls, indeed, which should be in our houses our greatest satisfaction, whether by recalling the scenes of the past or charming the eye now with rest and now with pleasing colour.

Royal Albert Hall.—An Assault at Arms in aid of the Afghan War Relief Fund will take place on Tuesday next, at half-past two p.m. We hope it will prove as satisfactory in the result as the one he'd last year.

PARSONAGES.*

THERE is no essential difference between the houses of which I have now to speak to you and those occupied by laymen of moderate means. A good parsonage would certainly constitute an admirable house for a gentleman whose income corresponded with or slightly exceeded that of the benefice to which the house was appropriate; while, owing to the difficulty in obtaining a site and to the limited nature of the funds available, it is not infrequently found better to buy an existing house for a parsonage than specially to build. A great deal, therefore, of that which I have to say will be just as applicable to a small house for a gentleman as to a parsonage, and I thus may venture to ask the attention of those who may regard a parsonage itself as not within their probable line of practice. I may here mention that you must understand me throughout as speaking primarily of country parsonages, standing in their own grounds, though much may be incidentally applicable to town houses. It is, however, manifest that in a house on a confined site in a town, probably with a party-wall on each side of it, you must give up feature after feature which enters into an ideal you may have some hope of attaining very near to on an open site. Moreover, the great majority of town clergy live, like the rest of us, in houses set out without regard to aspect, on sites artificially cleared, and so deprived of any features that may once have belonged to them, mechanically planned in mere imitation of adjoining houses, executed with a sole regard to cheapness, and without the most distant sense of beauty ever entering the designer's head,—and with regard to which a consistent public first carefully abstains from employing any architect, and then turns at intervals, as when pipes are found to be burst at the break up of a frost, and abuses our unfortunate but innocent profession. Town houses or parsonages would constitute a sufficient study for an evening here in themselves. It is inevitable, moreover, that my experience, being so largely gained in a southern agricultural and seaboard county, should give some tinge to that which I have to say this evening.

Parsonages differ from other houses not, as I have said, in essence, but in the accidents which surround them and give them any special character they may prove to have. These may be grouped under two heads,—first, their tenure; and second, the sources whence funds for their erection are raised. Parsonages do not belong to the parish, nor to the Church, either diocesan or general; in fact, there is no such body as the Church in any such legal sense as to be capable of holding property. The parsonage, glebe, and other property of a benefice belong to the incumbent, rector, or vicar, in right of his benefice,—not as a trustee, or in the same way that the freehold of the churchyard vests in the incumbent and gives him a vote for the county, but absolutely. Every incumbent is a corporation sole, that is, a corporation consisting of one person, with power to hold property and by his acts to bind his successors. He has a power of acquiring property, as far as I know, unlimited, and a power of selling, exchanging, and even of giving away, but these powers are regulated by recent statutes, and the last, I believe, was created by them and limited to such public purposes as providing sites for schools or the endowing new benefices. The bishop, as representing the Church, and the patron, in the interest of the next incumbent, have to be parties to nearly or quite all such operations. Although the incumbent has power to build, enlarge, or do anything else to improve the benefice at his own expense, or out of funds placed at his disposal, there are so many points likely to arise in which the consent of the bishop and patron are required that it is always well, before beginning to build, that they should be apprised of the fact, and probably that their approval of the plans should be asked. On no point are they more likely to be anxious than that the buildings should be appropriate to the benefice; and I find it is a consideration always present to the mind of a building incumbent that he must build in such a way as to be appropriate not to himself only, but to those unknown successors in the benefice whose requirements he has difficulty in realising. The more general information of the architect enables him to help his client in satisfying his conscience in this par-

* A paper by Mr. Lacy W. Ridge, Surveyor of Ecclesiastical Dilapidations in the Diocese of Chichester, before the Architectural Association on the 21st inst., as elsewhere mentioned.

ticular. It is a very common remark that the clergy over-build their benefices, that is, put up houses and buildings beyond anything the revenues of the benefice will enable a man to occupy and use, or even keep in repair. The greatest delinquents are those who seem to desire to add as much as possible to the number of their buildings, regardless of the quality of the materials and the soundness of construction. Bad building is entirely out of place on a glebe, and the lightest penalty one can wish for those who offend is that they may outlive their shanties, so that the dilapidations which must accrue thereon may be paid for by themselves, and not come as a burden on their successors. If, on the other hand, the buildings be sound and substantial, and fairly well adapted to their purpose, their being in excess of the absolute requirements of the benefice is not always an evil. There are, of course, livings in crowded places with unpleasant surroundings which it is difficult to imagine any one with considerable independent means accepting, and to saddle a man who looks to his professional income as a means of maintenance with a large disproportionate house is bad, as being in itself a cause of outlay which it would be well should be avoided, and as a temptation to extravagance. Where, however, the surrounding country has attractions, and where there is good society, a good house attracts men who have private means of their own, to the undoubted advantage of the parish; and in cases where the work is not too heavy, a large house well situated may be a considerable source of very legitimate income from its enabling the incumbent to take pupils. I know instances of livings in which the income is nominal,—some 50*l.* or 60*l.* per annum,—and in which a good house and grounds in a pleasant neighbourhood secures a succession of hard-working, though necessarily rich, incumbents. On the other hand, with considerably larger income, where the house is poor it is difficult in these days to fill a benefice. There are few cases, I think, therefore, in which a good-sized house is not of advantage to a living, though I believe stables, cottages, barns, sheds, and out-buildings generally should not be increased beyond that which is found to be absolutely necessary. Though I am in a position to assert that the popular idea which attributes universally to the clergy large families is a fiction, still it may be anticipated that sooner or later there will come to each living a man who will, with the venerable Vicar of Wakefield, have entertained and acted upon "the opinion that the honest man who married and brought up a large family did more service than he who continued single and only talked of population." Should it be your fate, therefore, to build for a bachelor or for a man whose immediate requirements are small, or when funds are limited, it is only right to remember that each new incumbent (or even the present one) may want to enlarge. If, therefore, you can furnish space in roofs which may hereafter be converted into attics, or otherwise prepare for this contingency, it will be well to do so. It is right also to expend the funds available in making the main house as commodious as possible, leaving it to future times to add bays, porches, and other similar features, which can be put on at any time. In some instances I have gone so far as to put in the girders for the openings into the future bays. A new parsonage should, therefore, be elastic, and this is, I believe, even more important in those cases where the work is light and the income of the benefice small.

Another point arising from the peculiar tenure of church property is the position of an incumbent with regard to repairs. He is landlord as well as tenant, and hence is liable for substantial repairs, and, if the necessity arises, even for re-building. The principle is recognised that the Church shall receive no damage during each man's incumbency, and hence there is no allowance for wear. Each man is to hand on the possessions of his benefice in as good a state, at least, not only as that in which he actually received them, but as that in which he should have received them, it being expected of each incumbent that he should recover from his predecessor dilapidations to the full extent to which the buildings had been allowed to deteriorate. This system came to be adopted because there was no other process for enforcing the duty of repairing,—the difficulties connected with which are certainly not confined to ecclesiastical property,—except, indeed, that in very extreme cases the patron might invoke the uncertain interference of those extraordinary ecclesiastical courts which constituted one of the greatest grievances of pre-Reformation times, which passed unreformed through the Reformation period only to find themselves ignored by the laity, and which, having in recent times been passed through a process of bungling and ill-tempered legislation, have only survived,—if, indeed, they have survived,—to find themselves set at nought by the clergy. No wonder dilapidation questions were taken to the civil courts. The judgment in the leading case of Wise *v.* Metcalfe lays down the law as stated above, with this addition,—that incumbents are not to be called on to maintain anything which is matter of ornament and luxury. From all this it follows that our workmanship should be thoroughly sound and good; that, though there need be no limit to the beauty we may attain to by good outline and proportion, there should be an almost total abstinence from ornamental features, and certainly from all architectural frivolities, the absence of which should, indeed, be suggested in any case by the staid characteristics of the class for whom parsonages are built and the circumstances under which the money to be expended is usually raised, which render culpable any outlay for which there is no useful result. The courts having held that internal papering and painting are merely decorative, it will be found convenient to omit the former, which cannot be executed till long after the building is finished, from the building contract, though with regard to the painting, I have never yet found any one strong-minded enough to follow the decision of the court to its logical conclusion, and leave internal work without paint, or its equivalent, staining and varnishing. Aviaries, observatories, conservatories, &c., are matters of luxury which incumbents are not called on to maintain, and must not be included in works to be executed with funds supplied from a public source. An incumbent is entitled to claim as his personal property the same class of fixtures as any other tenant, except that of late years the Ecclesiastical Commissioners and Queen Anne's Bounty Board have required that stoves, ranges, coppers, and other more important fixtures, should be included in specifications approved by them, and in such cases they go with the freehold.

We have next to consider those specialties which affect parsonage building, owing to the source whence the funds are supplied. These are as follow:—

1. The Patron. The person who owns the advowson represents the founder of a benefice, that is, the person who first set aside the endowment for the use of the incumbent, and hence there is a claim on him from time to time to supply, or assist in supplying, anything that may be needed. This is generally recognised. The Lord Chancellor, who is a great patron of small livings, has a special fund whence he makes grants for building. A great deal of the episcopal patronage accrued to the bishops at the time when the corresponding property went to the Ecclesiastical Commissioners, and in such cases the Commissioners recognise the claim. Private patrons generally contribute towards buildings for the use of their benefices.

2. Public Subscriptions. These are, of course, pure voluntary donations, whether they take the form of direct gifts, or of grants from diocesan or other societies.

3. The Ecclesiastical Commissioners. One of the objects for which the surplus of the revenues of the bishops, deans, and chapters, and the property of the sinecure offices in cathedral churches, were handed over to the Ecclesiastical Commissioners, was to supply parsonages, so that the parochial clergy might duly reside on their benefices. Lucky is the parish where local claim or other sufficient cause induces the Commissioners to make the full grant of 1,500*l.*, a sum sufficient to render comparatively easy the collection of funds for the erection of a good house. The systematic attempt to provide parsonages throughout the country naturally led to their requirements being studied. In this work the Commissioners have been assisted for very many years by an architect than whom no one more thoroughly commands the confidence of his professional brethren. This it is that will give the value to the more practical portion of this paper, when we come to consider in detail the requirements of a parsonage as set forth by the Commissioners.

4. Queen Anne's Bounty. The Governors of Queen Anne's Bounty make grants, in sums of 200*l.*, towards building houses out of the tenths and first-fruits made over to them by the Crown. The great use, however, of the Bounty is as a loan society, whereby an incumbent, whose interest in his living is limited, and may, in fact, cease at any moment, can borrow for building works, not on his own security, but on that of the benefice. This, by removing the temptation to build badly for temporary purposes only, has done very much to provide good parsonages. The money, of course, really comes from the clergy, because they have to pay it off in thirty years, with interest, at the not very moderate rate, considering the perfect nature of the security, of 4 per cent. Their requirements as to buildings correspond with those of the Commissioners. They retain as required by their Acts of Parliament, an old-world system of affidavits to be taken by the architect or surveyor; they want a statement of estimate on a form which, when you have got your builder's tender and know exactly what you are going to spend, it will take a good deal of anxious arithmetic to fill up for the first time; and have recently added a demand for bills of quantities *priced*, which is information an architect does not happen to be in a position to furnish. Considering you have sworn to the estimate, the necessity for the bills of quantities in enabling the Governors to judge of the propriety of the loan is not apparent.

Lastly, the clergy themselves contribute very largely to the parsonages and other buildings on glebes. In nearly every case some balance is paid in this way, and it is no unusual thing for a man to lay out considerable sums in improvements entirely at his own expense.

It is not unimportant to notice that no funds whatever are supplied by the State for this purpose. Neither public taxation nor local rates contribute anything whatever; the money is raised either by private donation or by the transfer of funds belonging to ecclesiastical offices, now considered to be obsolete or over-endowed, to more useful purposes. The State has no more right in parsonages than in any other form of private property, or at most than in such things as railway works, which have been from time to time the subject of Parliamentary legislation, but belong to private owners. This is not only true of modern parsonages, but of old ones as well, for they were at no time supplied from any other than private sources.

The oldest parsonage with which I am acquainted is at West Dean, situate in a hollow of the South Downs westward of Eastbourne. It is a long, two-story building, built of stone, with two-light windows with rebates for casements or shutters, a chimney-stack, and circular staircase. It is illustrated in Turner & Parker's "Domestic Gothic," and in the "Transactions of the Sussex Archæological Society." It had apparently but a single room on each floor, though there may have been movable partitions. It is now fitted up and used as a cottage. I know of no other complete Mediæval parsonage.*

THE VICTORIA TERMINUS, LONDON AND BRIGHTON RAILWAY.

NEW WORKS AND IMPROVEMENTS.

DURING the past few months extensive new works of a varied character have been in progress at the Victoria Terminus of the London and Brighton Railway, with the view of materially improving the structural character of the station, and adding to the general convenience and accommodation of the traffic. Amongst other works of this nature, the entire area of the roof of the terminus has been renewed, and reconstructed on a new principle, by which both additional light and ventilation has been obtained. The roof, which is 700 ft. long and 250 ft. wide, is divided into fifteen bays. In the old roof the lanterns were covered with glass and the sides with slates; but in the construction of the roof which is now approaching completion, slates have been discarded, and in their place other materials introduced, glass and boarding forming the sides of the bays, and what were the lanterns being covered with zinc. In the progress of this portion of the work about 36,000 feet of glazing have been used. No outside putty is used, and the glass is left free for expansion. The introduction of this system has already proved advantageous, as, although the greater part of the station has been glazed for some time past, there are as yet no breakages whatever. In the restoration of the roof, all the ironwork has been thoroughly cleaned and

* To be continued.

re-painted with Astbury's patent oxide paint; all defective portions of the iron having been renewed. One of the most important structural works in connexion with the renewal of the roof has been effected at the end adjoining the booking-offices. At this point two large steel girders have been erected, designed to take the principals of the roof of the end bays, thus removing from the front of the booking-offices the weight of the roof. This portion of the work was attended with peculiar difficulty, in consequence of the traffic having had to be uninterruptedly continued during its execution. These girders are respectively 120 ft. and 130 ft. in length, and 10 ft. 6 in. deep, and rest on two cast-iron stanchions, each weighing 6 tons. The foundations for these stanchions are composed of concrete and brick, with a basement of Bramley Fall stone, 18 in. in thickness. The girders were made at the Nine Elms works of the contractors, and are composed entirely of Weardale steel, with the exception of the rivetting portion, which is from the Low Moor Ironworks.

In addition to the works inside the station, above described, an iron and glass carriage-shelter has been erected outside, at the approaches to the station. It consists of a hip roof in five bays, being 220 ft. in length, and 42 ft. in width. The weight of each bay is carried by four cast-iron hip rafters, bearing against cast-iron compression beams at the top, and against columns at the base, wrought-iron lattice girders forming the ties. A moulded cast-iron gutter is fixed on the top of the girders, and the whole of the sides of the arcades are covered with Hartley's rough plate glass. The square at the top of each bay is boarded and covered with zinc, and surmounted by a cast-iron cresting. The columns have fluted and reeded shafts, with foliated capitals and bases, the bases being made specially large in order to prevent vehicular traffic from fouling the columns. The lattice girders are filled in with light iron scroll work.

Other works are likewise in progress at the station, including the formation of cellars under the platform protected by the carriage-shelter. The walls and floors of these cellars will all be composed of concrete, the ceiling of the cellars, which forms the platform, being also of concrete on iron joists, and the surface of the platform having a layer of asphalte 1 in. in thickness. A new covered entrance for cabs is likewise being constructed from Eccleston Bridge. It should be added that much additional light has been thrown into the area of the station by removing the wooden louvres from the screen in front of the booking-offices, and substituting glass.

The whole of the works are being carried out under the superintendence of Mr. H. E. Wallis, C.E., of Palace-chambers, Westminster, who has been entrusted with the work by Mr. F. D. Banister, engineer-in-chief of the company; and the contractors are Messrs. H. Young & Co., of the Eccleston Ironworks, Pimlico; the engineer in charge of the work being Mr. Orange. The zinc used in the works has been furnished to the contractors by Braby & Co., Limited. The estimated cost of the several works is from 15,000*l.* to 16,000*l.*

PROJECTED RAILWAYS, TOWN IMPROVEMENTS, AND OTHER PUBLIC WORKS.

THE investigation of private Bills is likely to occupy a considerable portion of the time and attention of Members of Parliament during the present session. The number of railway and other Bills for public works is 232, in addition to which there are 77 applications to the Board of Trade for provisional orders for the execution of works of a similar character, of which 35 are in respect of tramways, 19 for new gas and water works, and 19 in connexion with the construction of piers and harbours. Of the 232 Bills first named, 109 have reference to railway works, 18 to tramways, 31 water and gas works, 17 for harbour, dock, and port works, 24 for town improvements, the remaining 33 being Bills relating to works of a miscellaneous character.

No fewer than twenty-nine of the Bills are in connexion with projects affecting the metropolis, of which thirteen relate to railways. The London, Chatham, and Dover Company have three Bills, one of which seeks powers for the construction of a new bridge over the Thames at Blackfriars, in order to increase the accommodation for the suburban traffic of the company. We last week expressed our opinion of this project. Another of this company's Bills is for making a new line of railway between Greenwich and Blackheath. The London and South-Western Company apply for powers to still further enlarge their Waterloo Station, and also to widen and otherwise improve the Vauxhall Station. The London and North-Western Company apply for powers to alter the levels of Euston-grove, and to build a bridge over Drummond-street, in order to connect the Euston Station with their hotel opposite. A new company calling their undertaking the Fulham District Railway, apply for powers to make a new line from the Metropolitan District Company's railway, at Fulham, to Hammersmith. Another new company seeks powers to construct a railway from the Crystal Palace High Level Station of the London, Chatham, and Dover Company, to the Ladywell Station of the South-Eastern Company's Mid-Kent line. The Metropolitan District Company apply for powers to make junction lines at West Brompton and Hammersmith, and also to extend their line of railway from Ealing to Hammersmith. A new company have a Bill seeking powers to construct a railway from Guildford and Kingston, to the Metropolitan District Company's railway at Fulham. The Great Eastern Company apply for powers to widen the North Woolwich branch from Stratford Market to Canning Town. The Metropolitan Company have a Bill for powers in connexion with the construction of the Inner Circle Completion railway, and also apply for powers to widen the Metropolitan and St. John's Wood line. A new company likewise have a Bill sanctioning the construction of a dock on the Thames, at Bugsby's Reach, Greenwich, with a railway in connexion with the South-Eastern Company's line.

The miscellaneous Bills connected with the metropolis include, amongst others, several promoted by the Metropolitan Board of Works, and by the City municipal authorities. The Metropolitan Board of Works are promoters of Bills in reference to the proposed new bridges across the Thames, street improvements, house occupation by the labouring classes, and the purchase of interests on Hackney Common. The New Bridges Bill contains clauses providing, in connexion with the proposed new bridge between Fulham and Putney, for the removal of the aqueduct across the Thames belonging to the Chelsea Water Works Company, and in lieu of it constructing a conduit or pipe line within the roadway of the bridge. The Bill relating to artisans' dwellings contains a clause to alter the section of the existing Act which prohibits the Board from "taking for the purposes of the Act fifteen houses or more occupied either wholly or partially by persons belonging to the labouring classes until sufficient accommodation has been provided for the same number of persons elsewhere," upon the lands named in that section, and to remove or alter the restrictions imposed upon the Board. The Bills promoted by the City authorities include one relative to artisans' dwellings, in which power is sought by the Corporation to borrow money and make loans to the Commissioners of Sewers; and another Bill in which power is sought for the purchase and exchange of land on the Thames Embankment. There is likewise a Bill to Amend and Enlarge the Provisions of the Metropolitan Open Spaces Act of 1877, and to enable the Metropolitan Board of Works and any vestry or other parochial or local authority and the Corporation of the City, to acquire any open spaces within the limits of the metropolis, and devote them to public recreation, the Bill providing that disused churchyards, burial-grounds, and cemeteries shall be treated as open spaces. A Bill creating a London Water Authority contains clauses empowering such authority to purchase the London water companies, and also, if necessary, to obtain other sources of supply. There is also a Bill seeking powers to bring a supply of sea-water to London, from Lancing in Sussex, by means of pumping-stations, conduits, and reservoirs along the route, the works terminating in Fulham, Battersea, and Hammersmith; likewise a Bill for supplying spring-water to the various localities in South London, by the construction of pumping-station and other works in the parish of Basing, in the county of Hants, and other works in the counties of Sussex, Surrey, and Kent, the works terminating in Banstead and Tooting. The Cadogan and Hans Place Estate Company have a Bill seeking powers to make a new street, 140 ft. in length, from the west side of Sloane-street, opposite the south end of Cadogan-place, to the east side of Pavilion-road. The South Metropolitan Gas Company have a Bill for powers to construct new works and buildings on Greenwich Marshes.

A company proposed to be incorporated, called the London Suburban Market Company, are the promoters of a Bill, in which powers are sought for the construction of a market, slaughter-houses, shops, offices, and other buildings in Chiswick, for the sale of live and dead stock, horses, and other animals; hay, corn, and other cereals; fruit, vegetables, fish, meat, and other marketable commodities. The company propose to acquire 18 acres of land, for the purpose of erecting the market buildings and forming the grounds. In addition to the purchase of the land named, it is likewise proposed to lease twenty arches belonging to the London and South Western Railway Company, and also to take leases of adjacent grounds.

Under the title of a "Sectional or Block Buildings Management Authority," a company of a novel character, proposed to be incorporated, apply for an Act, in which powers are sought containing provisions for the management of buildings divided into separate tenements, and for facilitating the sale of such tenements. The clauses of the Bill provide for the management of buildings constructed in flats, sections of flats, sets of chambers or offices; also powers to the company to purchase rights of such buildings or sites for buildings, and powers to public bodies or local authorities to sell such rights to the company.

Amongst the Bills for proposed new works in different parts of the country there are several connected with the railways, the London and North-Western, Great Western, Midland, South-Western, Great Eastern, and other of the leading companies being the promoters of Bills of a very comprehensive character in connexion with their respective systems.

The town improvement projects include those at Leicester, Birkenhead, Barrow-in-Furness, Bingley (in Yorkshire), Staleybridge, Bradford, Salford, and Newcastle-on-Tyne. In all these several Bills, powers are sought for increased control over the construction of buildings and sanitary arrangements, together with powers for new and widened streets, several of the sanitary powers applied for being of a very stringent character as regards the occupation of underground dwellings and otherwise unhealthy houses. The Staleybridge Bill, amongst other provisions, contains clauses empowering the Corporation, in conjunction with the authorities of Ashton-under-Lyne, to purchase Stamford Park, belonging to the Earl of Stamford, and to convert it to the use of the public; whilst the Bill promoted by the Birkenhead Corporation includes clauses sanctioning the erection of a new town-hall, municipal offices, court-houses, police-stations, and other offices for public purposes; and also the formation and erection of public libraries and museums, and the erection of public baths and washhouses.

A COMPREHENSIVE TRAMWAY SYSTEM FOR LIVERPOOL.

THE Corporation of Liverpool, who have themselves undertaken the work of constructing and having control of the whole of the tramways within the boundary of the borough, have (as already mentioned by us) lately decided upon applying to the Board of Trade for powers to lay down new tramways along several of the thoroughfares throughout the borough, to the extent of thirty-two miles in length, the estimated cost of which is about 220,000*l.*, being at the rate of about 6,000*l.* per mile, calculated at present prices. This is in addition to ten miles of tramway at present laid down and open for traffic, the entire length of tramways within the borough, when the proposed works are completed, being thus forty-two miles. The undertaking was resolved upon at a special meeting of the Council, when, although there was a prolonged discussion on the subject, the members were almost unanimously in favour of the project, three members only voting against it. The new lines will stretch to the extreme north, south, and east boundaries of the borough. One of the principal lines is that along a fine broad thoroughfare at the south end of the borough, about a mile in length, and known as Prince's Park-road, leading to an ornamental park of that name, and likewise intersecting a district which now contains a large and constantly-increasing population. The locality is one in which there are numerous fine mansions, and where a large body of the Liverpool merchants reside. A memorial against the con-

struction of a tramway along this road, signed by a number of these merchants, was presented to the Council, in which it was stated that property would be much injured, but it was urged by the chairman of the tramways committee of the Council that, as the population in the locality intersected by the proposed line was from 120,000 to 130,000, it was the duty of the Council to regard the matter as one of convenience for the masses, and not for the few, and he added that, instead of the memorialists having their property injured by the tramway, the probability was that it would be very much improved in value. He further explained that in Princes-road there was a boulevard, 21 ft. in width, which was intended to be laid with wood pavement, for the use of those who wished to drive in carriages. The other districts in which the proposed tramways are to be laid down are those of Everton, West Derby, and other localities in the north and east portions of the borough.

The lines are to be leased to a tramways company, who are to work the traffic, paying the Corporation 10 and 7½ per cent. on the outlay for the construction of the several lines. This company has a paid-up capital of 400,000*l.*, and is at present working the lines already laid down.

INTERNATIONAL HERALDRY EXHIBITION.

AN exhibition of a novel character will, it is announced, be held in Berlin next year. This is an International Exhibition of Heraldry. Considerable progress has, it is stated, already been made in preparation for this unique show. At the last meeting of the committee, under the presidency of Count von Stillfried, it was reported that the Prussian Government, through the Minister of Education and Worship, had agreed to grant the use of the extensive exhibition buildings in the Cantians Platz, Berlin, for the purpose of the exhibition. It was added that a large number of persons who had been questioned on the subject had welcomed the idea, and signified their intention of becoming exhibitors. At the next meeting, to take place before the end of the current month, the general programme will be drawn up, after which it will be printed and widely distributed. The Exhibition will contain not only ancient models and relics connected with the craft and mystery of heraldry, but will also comprise various classes of objects, furniture, glass-paintings, embroidery, tapestry, carvings, &c., which are ornamented artistically with real heraldic devices.

EXTENSION OF UNIVERSITY COLLEGE, LONDON.

CONTINUING our illustrations of the additions that have been made to University College, Gower-street, we give plans of some of the most important departments. The wings were an essential part of the architectural design, and their total absence caused the portico to appear too large for the building; but during the last fifteen years advance has been made north and south, and the considerable addition now made to the north wing secures the completion of Wilkins's original design. University College stands now with both its wings in the proportions planned by its first architect. Its fine portico is seen at last to full advantage in its proper setting, and the whole building is a worthy home for an institution that stands by its own strength, and is what it desires to be, a university for London, which carries to the highest attainable point the work of teaching, and looks to the sister institution, known as the University of London, which is solely an examining body, to test qualifications and to confer degrees.

During the half-century that has passed since University College was planned, the growth of many departments of knowledge has created demands for space that were not within the conception of the founders. The number, also of the students has much exceeded expectation. Thus it has become absolutely necessary to extend Wilkins's plan. Each of the present wings, therefore, will finally spread for a little distance on either side by a T-shaped addition, fronting upon Gower-street. Space has also been obtained to an extent not easily realised until the rooms in the new buildings are seen, by change in the treatment of the roof. The whole range of eleven rooms now to be occupied by the department of

Physiology

has been obtained in this way. It includes a lecture-theatre, providing accommodation for 170 students, which is, in all its arrangements, a model of what such a lecture-room should be; a large working-room, with separate working-places for 100 students; a workshop and laboratories for different forms of study and for original research,—all this being gained by what is in outside appearance a very slight departure from the original design.

The department of *Zoology and Comparative Anatomy* owes to re-adjustments of space, made possible by the addition to the north wing, a series of nine rooms, including lecture-theatre, large students' workroom, museums, and laboratories.

The department of *Chemistry* is now furnished with thirteen or fourteen rooms, including a spacious and lofty laboratory built at the back of the new wing as an annexe, with an open court between. No fewer than nine rooms are set apart to different special operations.

Technical Chemistry,

also, is now provided with the space it needs. The chief lecture-room is an amphitheatre capable of containing 400 students. In the summer it is fitted up with tables for practical work at elementary analytical operations, and provides accommodation for 120 persons. Contiguous to it is a laboratory for preparing materials and lecture experiments, and also a museum for apparatus and chemical specimens. A smaller lecture-room is fitted up with tables suited for writing or for testing operations, and a small cupboard under each table serves to contain test-bottles, &c., which are put away when the tables are to be used by students in a lecture during which they perform no experiments themselves. There is in this lecture-room accommodation for eighty students. Adjoining is a library of chemical books for the use of students. The new analytical laboratory is a lofty hall (74 ft. by 25 ft.) lighted from above. It contains working-desks sufficient for fifty students,—those at one end being fitted up for beginners, and those at the other end for more advanced students,—all of them exceedingly spacious and commodious. In the middle of the laboratory are various appliances for general use, such as,—(1) a table fitted up for treating substances with sulphuretted hydrogen. Each bottle through which the gas is being passed is surrounded by a glass cylinder, through which there is a powerful down-draught passing. The substance under treatment is conveniently accessible, yet none of the sulphuretted hydrogen can escape into the air of the laboratory. (2) Water-baths heated by steam from a boiler outside. Each evaporating-dish is heated by itself in a current of pure and warm air, whilst all the fumes which pass off from it are drawn directly into a flue without any probability of contaminating the contents of other dishes. (3) Water air-pump and Sprengel pump. (4) General re-agents and apparatus. (5) Reservoir of distilled water and tank of hot water.

For evaporating purposes there are a number of stalls of various sizes, so fitted up that an iron dish containing sand, or a porcelain basin, can be heated in each of them by gas, while all the fumes and vapour are drawn off by a powerful flue behind each stall. For apparatus of various forms and constructions there is a long and wide slate-table so arranged that any apparatus from which noxious fumes are liable to be evolved can be surrounded by a casing through which the air is rapidly drawn by a powerful flue. For fusions and calcinations there is a row of furnaces of various constructions mostly heated by gas and with a powerful draught. For the more special operations of the laboratory there are nine rooms, mostly in the adjoining basement.

The Engineering School.

The teaching of the science of engineering appears to have formed a part of the original scheme of the founders of the University College. As far back as 1840 the late Mr. Charles Vignoles was appointed Professor of Civil Engineering, a post which he held for some years. Until recently, however, it had not been attempted to do more than provide lectures on different branches of engineering, with instruction in mechanical drawing and in surveying. The present extension of the building has enabled a very important change in this respect to be carried out by the establishment of a "laboratory" in connexion with the engineering school, an institution which differs in some important respects from anything which has hitherto existed in this country. In explaining the nature of this engineering laboratory, it may be stated, in the first place, that it is believed that no college education can supersede, for the young engineer, that practical training which he must necessarily obtain somewhere, and which can only be properly obtained on works or in the workshop or office. It is not therefore attempted to do anything which can render unnecessary a pupilage, or its equivalent, in the profession. But there are some matters of a more or less practical kind for obtaining a knowledge of which an ordinary pupilage seldom affords any opportunity, but which are of very great importance to the engineer in after-life, and which at the same time appear to fall entirely within the province of an institution like University College. These matters may be summarised in a few words as being the experimental methods which serve for determining the mechanical data employed in engineering calculations; and the main object of the engineering laboratory is to give systematic instruction in such experimental work.

The laboratory-work proper is intended for senior students. But there are many advantages in providing somewhat similar work for junior students, so far as it is possible to do so; and this is done in the workroom, which is fitted up under the same roof as the laboratory. The work here forms a preparation for the work in the laboratory, and at the same time it aids in many ways the class-work of the students, while it helps to develop their constructive mechanical skill. It is divided into three sections, the whole being under the general charge of the professor of engineering. One section, under the direction of Dr. Oliver J. Lodge, forms a junior practical course of physics. The students scheme out and construct simple physical apparatus, and are taught how to experiment by means of the apparatus they have made. The work of a second section, under the direction of Professor Henrici, is connected with the classes of applied mathematics, and in it are constructed models of surfaces and mathematical models in general, apparatus for the mechanical description of curves, and other similar instruments. In the third section, under the direction of Professor Kennedy, are made models of different mechanisms or machine details, models illustrating the distribution of stress in bridges and other structures, the arrangement of different types of valve-gear, &c. Simple experimental apparatus is also made, and mechanical experiments conducted by help of it.

The erection of the north wing of the College has set free a considerable space in the basement of the old building for the purposes of the engineering laboratory, which, with the workroom, now occupies a large room about 90 ft. long by 44 ft. wide, and additional space adjoining it. The laboratory contains a large testing-machine, capable of exerting a maximum pull of 100,000 pounds (or nearly 45 tons), and arranged so as to be capable of either stretching, compressing, or bending the specimen to be tested; specially-arranged appliances for making accurate measurement of extension, compression, deflection, &c., down to $\frac{1}{10000}$ of an inch; machine-tools of various kinds; specially-designed apparatus for conducting experiments of the kind just mentioned, as well as the necessary tools and appliances for working in wood and metal, preparing apparatus and specimens, along with standard gauges and measuring apparatus; a small engine, &c.

It remains only to add that the scheme for an engineering laboratory which has here been sketched out, and which was started last year at University College, and has this session been much enlarged and developed, has already received the very cordial approval of many of the most important and best-known engineers in the country. Much as has been done, all needs of space are not yet met, and as the work of the College is still growing, the Council has determined to persevere in the endeavour to complete the building as soon as possible in accordance with the revised design. The whole cost will be about 100,000*l.*, of which the buildings now finished take 35,000*l.*; of this 21,000*l.* have been already subscribed. The whole development of University College has been by voluntary work of friends of education. At no period of its history has it received one

penny from the Government. The buildings now opened are evidence that the cause of higher education, open to all comers without distinction of sex or creed, has vigorous friends, and we are hardly afraid to predict that the entire completion of the College will not be long delayed.*

LONDON STREET ARCHITECTURE:
No. 1, OLD BOND-STREET.

No. 1, Old Bond-street, of which we publish a view this week, is now just completed. It has been entirely rebuilt from the designs and under the superintendence of Mr. Alfred Waterhouse, A.R.A.; and occupies the site at the corner of Old Bond-street and Piccadilly, having its longer side to Bond-street. The ground-floor is occupied by two shops, of which the one at the corner of the street is Messrs. Scott & Co.'s new premises. Between is a staircase giving access from either shop to the upper floors. These rooms are arranged as galleries, with excellent light. The building is constructed in a massive manner, the superstructure being carried on solid brick piers and semicircular arches. The owner, Mr. Christy, has the right to project beyond the supporting arches on the ground-floor; the shop-fronts are, therefore, arranged in front of these, and consist of a series of polished dark shap granite pilasters bonded to the brick piers, and carrying an entablature of the same material. This arrangement provides a balcony at the first-floor level, which has a handsome wrought-iron balustrade.

The upper part of the building is constructed of red brick and buff terra-cotta, and the jambs and window-heads are moulded in two orders, and various panels of enriched design are introduced. A broad band of alternate brick and terra-cotta, the latter with pateræ of varied design, girds the building just below the first-floor windows. The most noticeable feature is a bold bay at the angle of the structure, brought forward to the face of the granite work; it terminates in a gable slightly higher than the dormers which overtop the cornice on either side, and is enriched with conventional foliage in panels. The position of this bay gives it a wonderful view down the length of Piccadilly westward. The shops are fitted in American walnut, and mirrors are introduced on the faces of the piers. The windows, which are glazed each with a single sheet of plate-glass, are not furnished with shutters, but wrought-iron grills are arranged to run from below the window-sill to protect the lower portion of the windows when the shops are closed.

The work has been executed by Messrs. Holland & Hannen, of London; and Mr. Richards was the clerk of the works.

THE TOWN CHANCELLERY OF KONSTANZ.

THE observant visitor to the town of Konstanz on the Bodensee,—formerly a flourishing free imperial city and the scene of great historical events,—on wandering through its now deserted narrow streets will be much impressed by the fact how very often political vicissitudes determine the fortunes of a particular town or country. Formerly, as we have just said, a Free City of the Empire, with 40,000 inhabitants, —a great number 400 years ago, it must be borne in mind,—it has now shrunk to a population of about 10,000 souls. Konstanz never recovered from the great blow which struck down its liberties and privileges, intercepting, at the same time, the sources of its prosperity, when, in 1548, it became subject to Austria. Its free municipal institutions and its flourishing trade were gradually ruined by this transfer, it is true; yet its old monumental buildings and older memories could not be taken from it, and remain to this day to testify to former and more prosperous days.

The edifice which we illustrate in this week's *Builder*, the Town Chancellery, or Stadtkanzlei, although not reared in the heyday of its existence, having been begun in 1593, or half a century after Austria took possession of the town, is still an evidence of the self-confidence and power of the burgherdom of that time, which had not then been sensibly diminished. The building is, at the same time, a witness to the predominance of a style of architecture which had not been the outcome of a scheming builder with a mind devoid of taste, but which had been engendered by a desire to produce an ornamental façade. The Chancellery of Konstanz bears the impress of Florentine Renaissance, then at its zenith. This is especially evident from the higher eastern gable,—the building, properly speaking, is a combination of two separate houses,—with its clock, and the lower western one, from the round window arches ranged side by side in twos and threes, and framed by caryatides and other decorations sculptured in grey sandstone, and, finally, from the projecting supporting piers, rising from the bottom of the building to the windows of the first story, and the doors and windows between.

Taken by itself, the edifice is full of interest, which is considerably increased by the modern frescoes and pictorial decoration which have been added at the instance of the town council by the two artists Herren Ferd. Wagner and H. Fröschle; these adornments resembling, to some extent, those of the celebrated Fugger House of Augsburg. The façade of the chancellery, thus treated, appears to the beholder as a combination of large panels, on which have been represented the most important phases in the civil life of the town, and the many and fateful changes through which it has passed since pre-mediæval times, a lasting memento for succeeding generations.

This decoration is so varied and of such a rich character that the space at our disposal would be exceeded were we to enter into a full description of each separate detail; but, as the original is faithfully depicted by our illustration, a few short explanations will suffice.

We find, in the first place, distributed over the gables and the several stories, a number of coats of arms, which, with the exception of that of the town of Konstanz, over the window arches of the eastern side of the second story, belong to old patrician families of the town. A second category of decorations is formed by the portraits of eminent men and women who were either born at Konstanz or have rendered meritorious services to the town. The first portrait on the eastern side of the second story is that of the first bishop of Konstanz, Maximus; then follows that of H. Blarer, the restorer of the hospital of the town; and on the western part of the building that of Chr. Schulthaiss, formerly burgomaster and chronicler of the city (died 1584). In the first story are placed, in the same order, the likenesses of the Reformer Ambr. Blarer; of Ulr. Zesius, the, in his time, well-known professor of jurisprudence at the university of Freiburg; and of Heinrich v. Wessenberg, for many years administrator of the episcopal see, who, on his death on the 9th August, 1860, bequeathed his library to the town. The latter strove earnestly for reform within the Roman Catholic Church, and took a deep interest in the national aspirations of the German people. The last of the portraits is that of Maria Ellmrieder, court painter (born and died at Konstanz), who left to her native town the so-called Golden Book, a number of valuable pictures, now framed and preserved in the Wessenberg Gallery. Here may also be mentioned a statue, 6 ft. high, of the Emperor Constantine, who is supposed to have founded or enlarged the city; it is placed on a pedestal resting on the second supporting pier. All the portraits above enumerated are judiciously and harmoniously enclosed by allegoric representations, together with floral adornments or other acroteria. In the second story these decorations are allegories of music, poesy, and architecture; in the first story, of sculpture and painting, printing, and commerce, once so flourishing in Konstanz. In the gables, charming groups of children represent navigation and fishery, spinning and weaving, the present means of subsistence of the once powerful and populous city.

Most valuable, from an artistic point of view, are the historical frescoes, by F. Wagner, between the piers and above the door and window arches respectively of the ground-floor. The first represents the moment when Emperor Frederick Barbarossa, after vainly endeavouring to break the love of liberty of the Lombardic cities, confirms, by offering his hand as a pledge, the treaty of peace concluded at a great assembly, attended also by the Italians. He is surrounded by the delegates of both sides, the principal of whom are signing the compact drawn up. The subject of the next fresco is the entry of Frederick of Naples, of the house of the Hohenstaufens, who, after he had been elected by an assembly of German princes as the anti-emperor to Otto IV., of the house of the Welfs, marches through Lombardy, crosses the Alps, and, after many toils and perils, appeared before the gates of Konstanz, asking to be admitted. Persuaded by high dignitaries of the Church, the burghers opened their gates to Frederick, when, scarcely three hours later, Otto made his appearance, but found them closed against him. From that hour the cause of the Welf was lost, that of the Hohenstaufen, afterwards Emperor Frederick II., won. The third picture illustrates the act of Emperor Sigismund,—at the time of the Great Council, on April 19, 1417, and surrounded by princes, prelates, and nobles,—of bestowing the electoral dignity upon Burgrave Frederick of Nürnberg, Count of Hohenzollern, the latter promising on oath to perform the duties of his new office and towards the German Empire. This was the first step on the path of honour and greatness which, after many struggles and victories over powerful opponents, has only in our time reached its culmination. The last fresco, finally, extols the courage with which the burghers of the old cities faced death, and their willingness to make sacrifices in defence of liberty and faith. The town of Konstanz, which clung firmly to the Reformation, was in 1546 surprised by an army corps of 3,000 Spaniards. The small burgher force which had set out to meet the enemy had to retire before superior numbers, and were driven back upon the Rhine bridge. When they arrived at the drawbridge, at the Rhine Gate, they found it nailed up,—they were betrayed. It was then that they swore to sell their lives as dearly as possible. They threw themselves upon the advancing enemy, and a most determined fight ensued, even mortally wounded burghers seizing as many of their foes as they could grasp, and throwing themselves along with them over the bridge into the Rhine. It is true the Spaniards were repelled by such bravery after a most sanguinary struggle, lasting five hours, and the town thus saved for that time; but the heavy sacrifices had been incurred in vain. By a resolution of the majority of her citizens, Konstanz surrendered herself to the house of Austria, and her religious liberty and independence as an imperial free city were buried by that act.

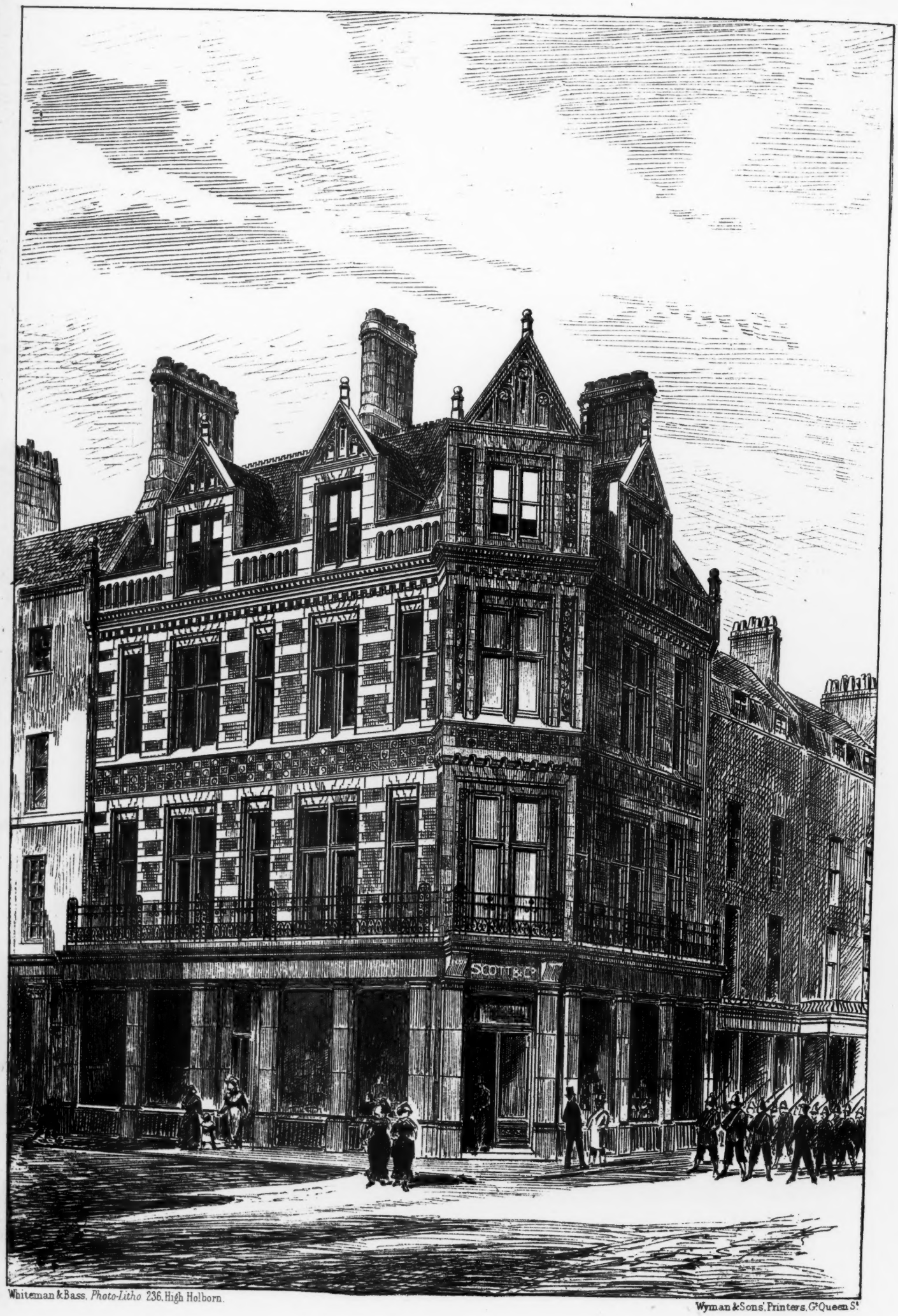
The present purpose of the remarkable Kanzlei is to preserve in its fireproof vaults the valuable civic archives, veritable treasures, including among them 2,800 ancient charters. But the building cannot but be a permanent stimulus for other towns to strive to educate the minds of the people, and to assist in perpetuating the memories of great and good deeds of the past.

VILLA, THORNHILL PARK, SUNDERLAND.

THIS house is situated at the south-west corner of Thornhill Park, and has been built for Mr. J. S. Wilson, from plans by Messrs. J. & T. Tillman, architects, Sunderland. The whole of the material and the workmanship is of good quality. The facing is of red-pressed bricks from Sherburn Colliery, and the stone strings, mullions, and other dressings are from Alnwick. The walls and floor of the entrance-porch are tiled, and the four windows are filled with stained glass representing the four seasons. The walls of the bathrooms, waterclosets, and lavatories are also tiled from floor to ceiling. The staircase is lighted from the roof by an ornamental ceiling-light filled with brilliant cut plate-glass. Each room has a vent-flue built in the chimney, and also a vent fixed in the centre of the ceiling communicating with outside. The hall and staircase are heated by a coil of hot-water pipes. The cost will be about 3,250*l*. The work has been carried out by Messrs. Howarth, mason and joiner; Rule Brothers, plasterers; J. B. Wilkinson, plumber; and George Tawse, painter and decorator.

Darlington.—Considerable improvements in the way of alterations and additions are about to be made to the Wesleyan chapel, Bondgate, consisting of the lengthening of the chapel from east to west, new entrance-lobbies, re-pewing, new pulpit, enlargement of present vestries, and erection of new vestries and committee-rooms. The work has been intrusted to Mr. G. G. Hoskins, F.R.I.B.A., of Darlington.

* The plans marked as "Professor Lankester's Department" are those of Comparative Anatomy and Zoology, and are fully described in our previous number (p. 91, *ante*).



Whiteman & Bass, *Photo-Litho* 236, High Holborn.

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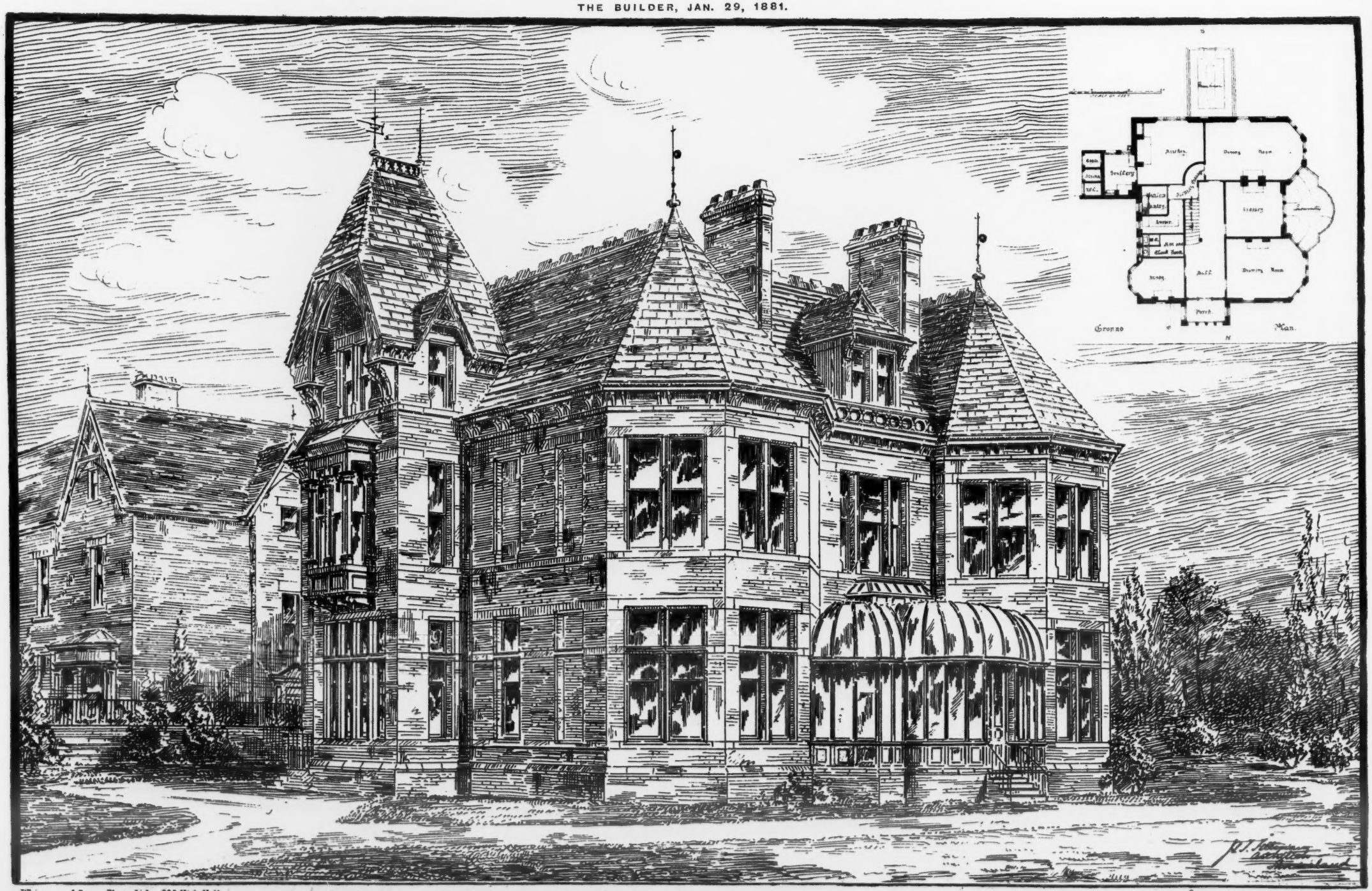
LONDON STREET ARCHITECTURE: No. 1, OLD BOND STREET.——Mr. Alfred Waterhouse, A.R.A., Architect.



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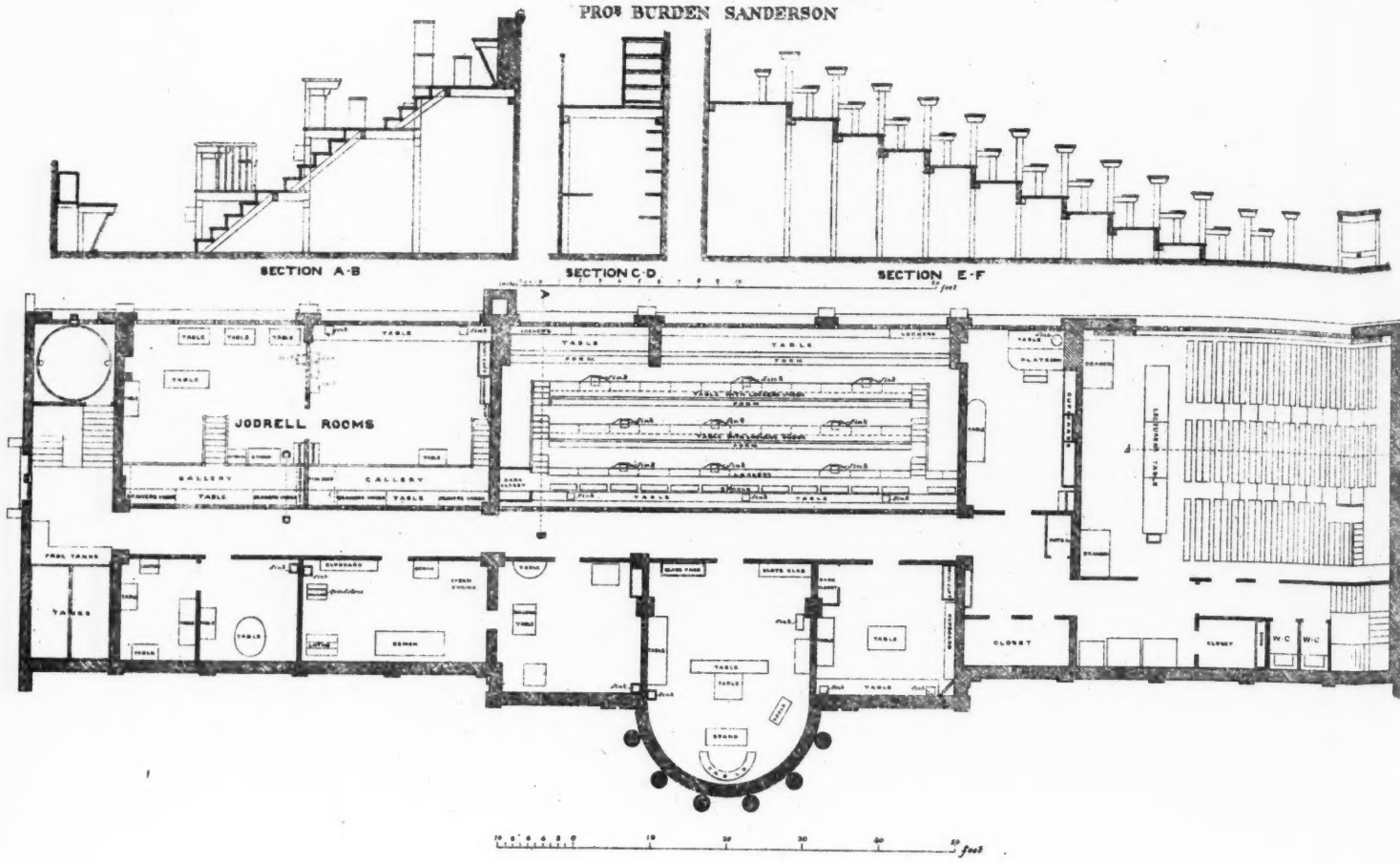
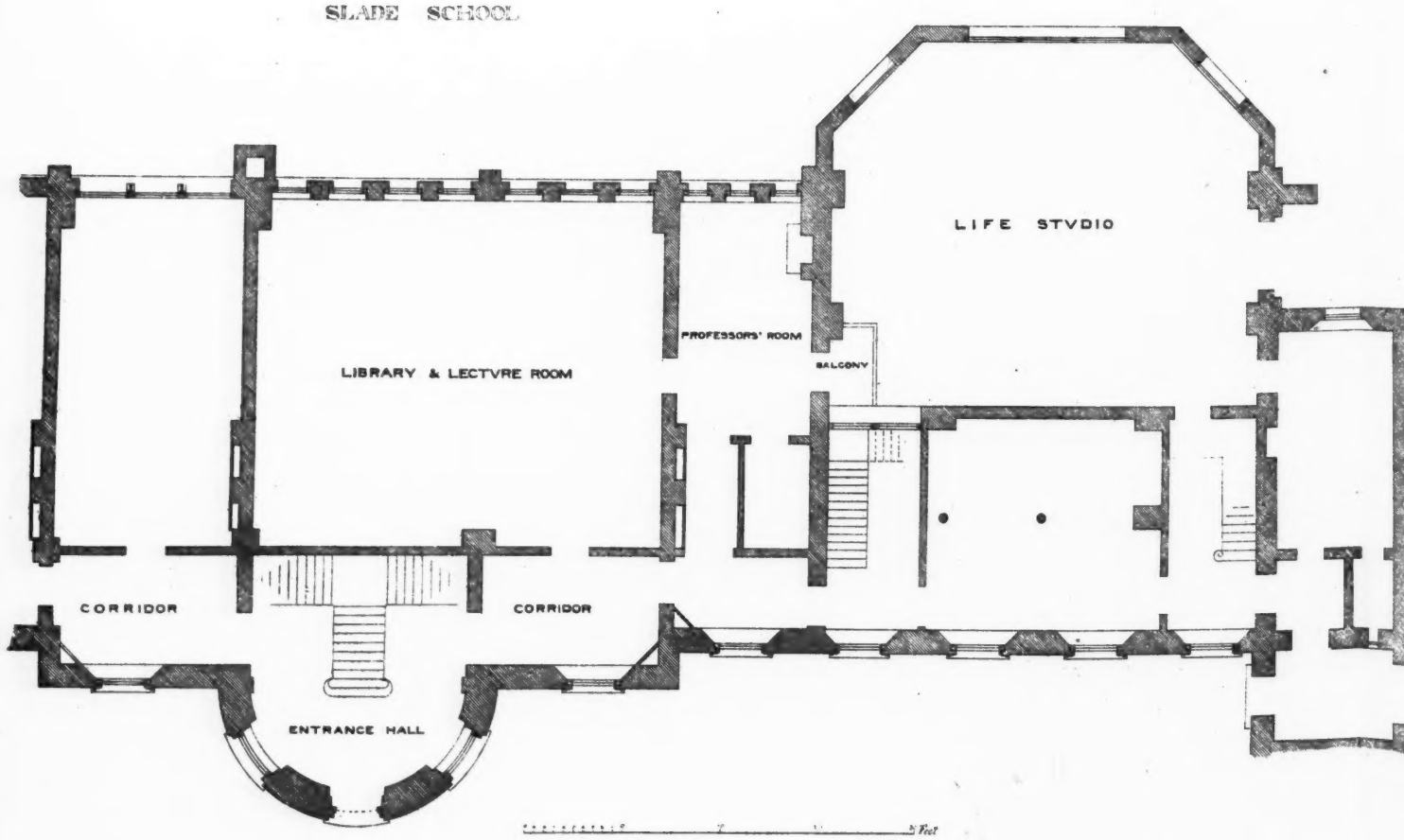
Residence Thornhill Park. J. & T. Tillman, Architects.

PHYSIOLOGICAL DEPARTMENT
PROF BURDEN SANDERSON

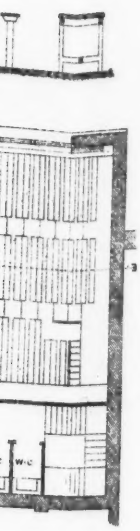


SLADE SCHOOL



Whiteman & Bass, *Photo-Litho.* 236, High Holborn.

UNIVERSITY COLLEGE, LONDON.—PLANS



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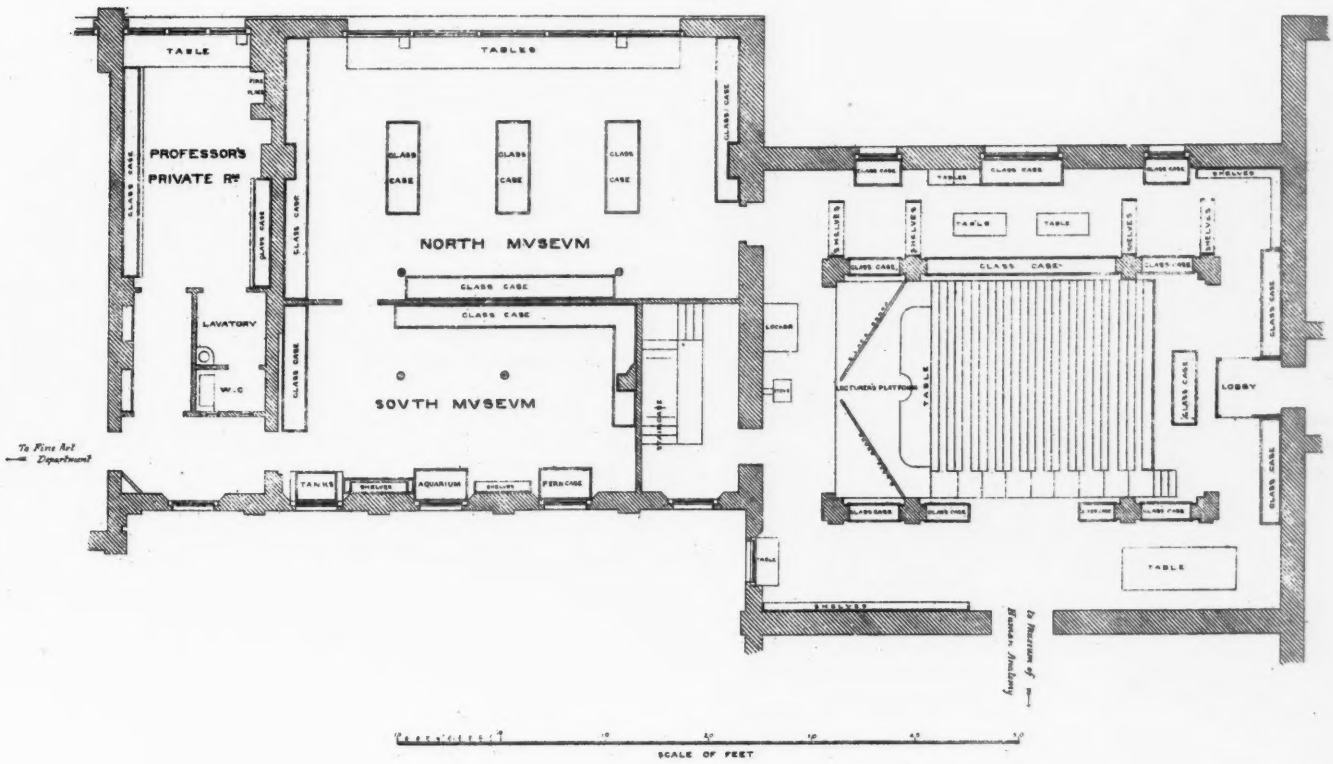

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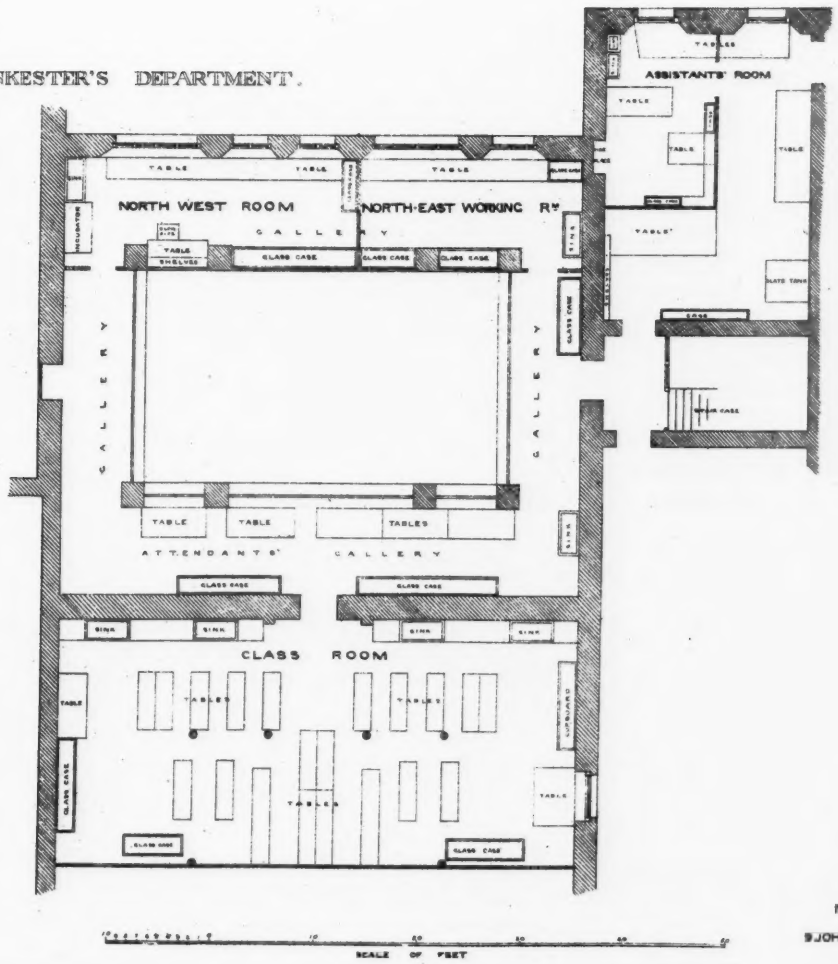

MESSRS PERRY & REED
ARCHITECTS
9 JOHN STREET ADELPHI.

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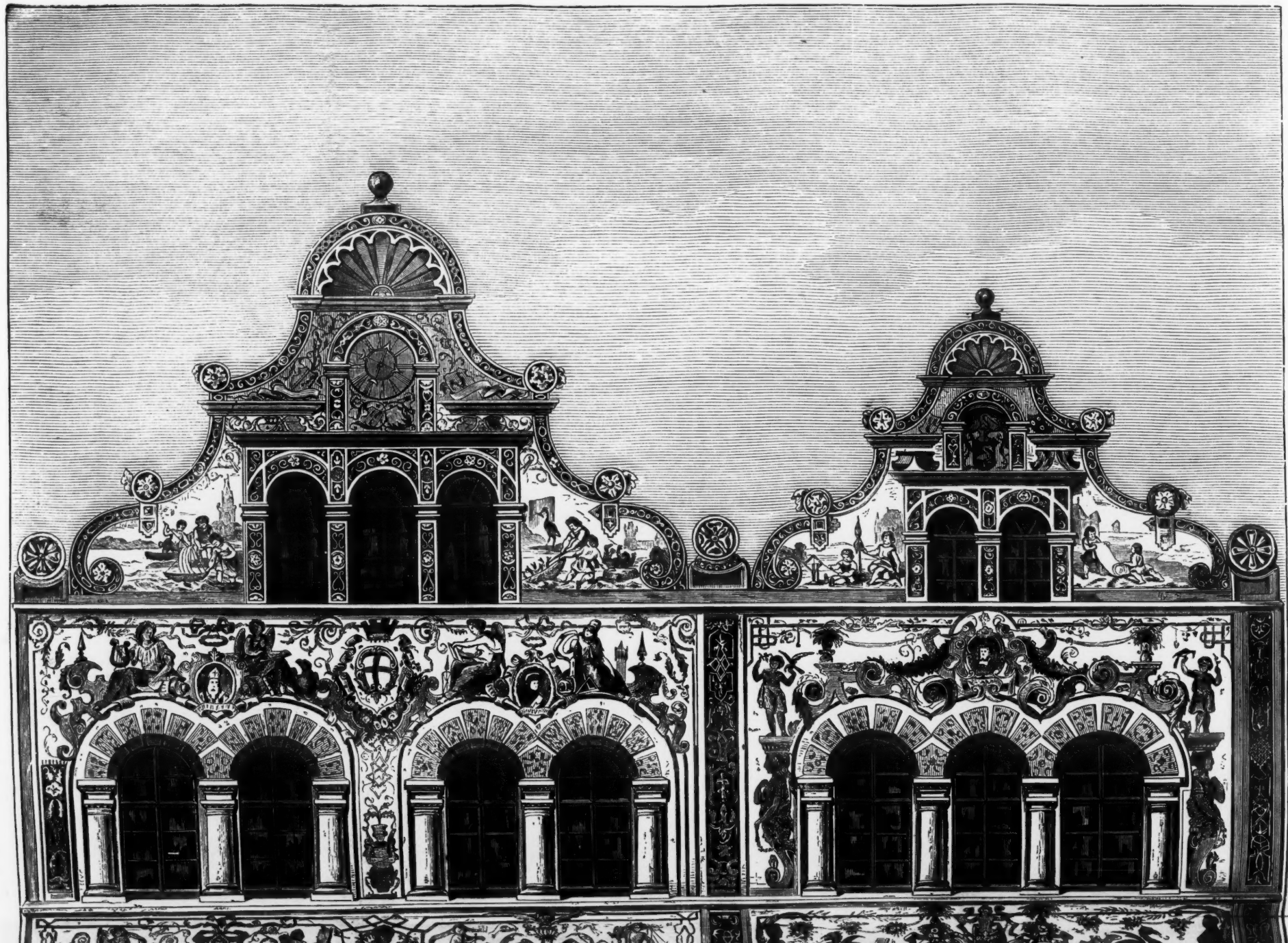
—PLANS OF SOME OF THE DEPARTMENTS.



THE TOWN CHANCELLERY, KONSTANZ.——Commenced A.D. 1593.

ARCHITECTURAL ASSOCIATION.

PROPOSED TRAVELLING STUDENTSHIPS.

AT the ordinary fortnightly meeting of this Association, on the 21st inst., Mr. Ernest C. Lee, president, in the chair, Messrs. Edward W. Smith, F. K. Parker, Arthur Smythe, and H. W. Simpson were elected members.

It was announced that arrangements had been made for the members to visit the new Standard Assurance offices this Saturday afternoon, the 29th.

Mr. Page, honorary secretary, read a letter from Mr. C. G. Vinall, honorary secretary to the Society for the Protection of Ancient Buildings, referring to some remarks made during the discussion on Mr. Pink's paper on the Churches of Norfolk, and which remarks were reported in the *Builder* a fortnight ago (see p. 82, *ante*). The letter contained the following passages:—

"The Society has made efforts for the preservation of many of the churches of Norfolk; amongst others, of North Walsham, and of St. Peter Mancroft and St. George Tombland, Norwich, besides having issued a pamphlet on 'Restoration in East Anglia,' a copy of which is enclosed. The Society is now occupied in endeavouring to procure the repair of Knapton Church. It recently drew the attention of the restoration committee at North Walsham to the nave roof of the church, and appealed to it to retain as much as possible of the remarkable and unique old roof, instead of wholly replacing it by a modern imitation.

The Society has from time to time, for a lengthened period, directed its efforts against the works that have been, and are being, done at St. Alban's Abbey, and it opposed the granting of the faculty recently applied for for the restoration of the west front. In face, however, of the local approbation of the proposed restoration, its opposition was futile, and no further action seems now possible.

The Committee thinks that the same publicity should be given to this statement as to the remarks of the speaker referred to, which were, of course, made in ignorance of the proceedings of the Society."

Mr. Thomas Blashill called attention to a favourable opportunity which would present itself to architectural students who might desire to visit Rome for a short time in the spring. An excursion train was to leave Paris a week before Easter, and return thither a week after Easter, allowing of six days' stay in Rome, two days in Florence, and one day each in Turin, Geneva, and Pisa. Those who went on this excursion would be absent seventeen days from London, but of them, nine only were full working days. Mr. Blashill stated that he went last year with two pupils on the first excursion of the kind, and as he went with the intention of testing the utility of the scheme for young men and others whose time is limited, he was able to recommend others to avail themselves of such excursions. As Rome was filled with visitors at Easter, and the smaller towns would sensibly feel the influx of say 500 excursionists, it was better to go with the recognised excursion agents, who would arrange before-hand for hotel accommodation, railway fares, refreshments, carriages, omnibuses, and guides, at rates varying from 16*l.* to 18*l.* per head. Besides this, a smaller or larger sum would be wanted for extras, chiefly photographs, which (as time would hardly admit of sketching) should be bought rather liberally at the very low Italian rates. He offered to afford any further information on the matter to all who might apply to him, and advised all who saw any prospect of being able to go, to at once join together and meet frequently during the next two or three months, to read up Roman history, and consult the large number of architectural works now available, and generally prepare themselves for comprehending as much as possible of what they would see in the little time that they would have to see it.

Proposed Travelling Studentships.

The President said he had a very satisfactory communication to make. It would be remembered that at the opening *conversazione* and at the first business meeting of the session, attention was called to the desirability of establishing a travelling studentship in connexion with the Association. It was then considered that 400*l.* or 500*l.* might be raised for the purpose, if not entirely amongst the members of the Association, by the help of the senior members of the profession. Some of the committee, however, were of opinion from the first that the Association, numbering as it did 800 members, could raise the money among its own members exclusively, and foremost among those who had been unwavering in his faith in the Association's power to raise the money required was Mr. Aston Webb, the hon. sec. to the fund. It was gratifying to state that Mr. Aston Webb's faith in the Association's power to help itself had been more than realised, for although not more than one-eighth of the members had yet been appealed to, the sum of 515*l.* had already been promised, the past-presidents and other senior members of the Association having contributed very handsomely. The committee entertained the belief that as seven-eighths of the members had not yet been appealed to, it would be possible to raise a further sum of 300*l.* for founding a second prize to be awarded to the member who obtained the second place in the competition for the studentship. The President further announced that it was the intention of the committee to send out a student this year, and stated that, in establishing the studentship or studentships, it was the first desire of the committee not to interfere or compete in any way with existing prizes of a similar character, and with that view the age of competitors had been limited in the present year to 25, in 1882 to 24, while in 1883 and afterwards the limit of age would be 23. The conditions of the proposed studentship stipulate (1) that every candidate for it shall be a member of the Architectural Association. (2) That the studentship shall be of the value of not less than 20*l.* per annum, and the tour of the successful candidate shall extend for at least four weeks, and shall be made some time during the Association recess. (3) That the drawings, &c., submitted in competition for the studentship shall be sent in addressed to the honorary secretary of the Association by the first Friday in May in each year, and the studentship shall be awarded at the last meeting of each session. (4) That the drawings to be submitted by each candidate when competing for the studentship shall consist of:—One drawing from the round (shaded); three sketches from existing buildings (or portions thereof); six sheets of measured drawings from buildings erected prior to the year 1750, drawn to ¼-in. scale, with at least one sheet of full-sized details, on sheets of paper not exceeding imperial size. Should the conditions not be adhered to in any particular by the candidate, he will be disqualified. (5) That accompanying the drawings shall be a written statement by the applicant, giving his age, and an account of his professional training. (6) That the student, prior to the commencement of his tour, shall receive the sum of 10*l.*, and, should the judges be satisfied with the work executed by the student when on his tour, a further payment of 10*l.* shall be made, and a bronze medal presented to him at the annual *conversazione*. The work executed by the student shall be sent to the honorary secretary of the Association not later than the 15th day of October, and shall, with the approval of the judges, be exhibited at the annual *conversazione*. (7) That immediately after his appointment, the student shall inform the honorary secretary of the Association what locality (either in the United Kingdom or on the Continent of Europe) he has chosen, and the route he proposes to take, as well as the date upon which he proposes to commence his tour. Other conditions follow, the last being that no member who has already obtained any travelling studentship will be eligible to compete.

Mr. Lacy W. Ridge then read a paper on "Parsonages," the first portion of which we print on another page. In the discussion which ensued, Mr. Ewan Christian was the principal speaker. We defer a report of his remarks in order that we may give them *in extenso* next week.

AN INTERESTING DISCOVERY.

IN the last number of the "Year-book of the Royal Prussian Art Collections," Herr W. Bode gives an account of an interesting discovery which has recently been made at the Berlin Museum. At the foundation of that institution, a large number of paintings, most of them belonging to the Solly Collection, which was purchased in 1821, had been laid aside as of little value. These works, numbering nearly 2,000, were recently subjected by Herr Bode to a renewed and thorough revision. In the course of this labour his eye was caught by a painting containing several portraits, which reminded him strongly of the works of an anonymous artist to whom attention has frequently been directed in recent times, and who has hitherto been known only under the title of the "Master of the Hirscher Collection." Herr Bode was so struck with this work that he examined it with more than ordinary care. On the back of the panel a long Latin inscription was found, which, after the grime of ages had been removed, proved to contain the names of the persons represented in the painting, viz.,—the Imperial Councillor, Johannes Luspinianus; his second wife, Agnes; and his two sons by his first marriage. The picture is further described as a pendant to an earlier work of the same artist, a family picture of the Emperor Maximilian, which is already known as being by the above-mentioned "Master of the Hirscher Collection." What is still more important, the inscription gives the name of the painter. He calls himself Bernhard Strigel, and states that he was a citizen of Memmingen. This painting, he says he produced at Vienna in the year 1520, when he was nearly sixty years old. He painted it, he says, with his left hand. He adds that as once Apelles only was permitted to paint the portrait of Alexander, so he, Bernhard Strigel, had obtained sole permission to produce the likeness of the Emperor Maximilian. It is conjectured that Bernhard Strigel was of the same family as Claus Strigel, who was nearly contemporary with him, and was also a native of the same place, Memmingen. Johannes Strigel, too, an artist who flourished about 1442, was also probably an ancestor. It was the well-known critic, Herr Woltmann, who first declared that the various paintings, recently attributed to the "Master of the Hirscher Collection" were the productions of one and the same person, whose style greatly excelled that of his Swabian contemporaries in point of colouring, and who was generally a painter of undoubted eminence. This artist is now identified as Bernhard Strigel. In a list appended to Herr Bode's article, Herr Scheibler mentions nearly sixty hitherto anonymous paintings, which, he says, must be regarded as the works of Bernhard Strigel. These productions, which are scattered about in various galleries, are at present attributed to many different hands. Many of them, in fact, were formerly attributed to Holbein. It is hoped that researches in the archives of Germany and Austria will before long bring to light further details of the life and works of this long-forgotten artist. The painting which has led to this interesting discovery will shortly be hung in a prominent place in the Berlin Museum.

SCARBOROUGH.

The New Post Office is now nearly completed The building has its frontage to Huntriss-row. The elevation, which has been designed by Mr. James Williams, of Her Majesty's Office of Works, is of Classic design, and up to the first floor the material used is stone, and above the first floor to the main cornice, red bricks and stone. The area excavated for the basement and offices measures 112 ft. by 46 ft. The ground-floor, in which the public business will be carried on, consists of the public office, a room 40 ft. long and 23 ft. 6 in. wide with a height of 17 ft.; a sorting-office, 54 ft. 3 in. long by 27 ft. wide, lighted both by side and lantern lights; and the postmaster's room, 12 ft. 6 in. by 14 ft. 6 in. The first floor contains the telegraphic instrument room, and the boys, messengers, and telegraph clerks' retiring-rooms, and on the staircase landing are placed the lavatories, &c. The instrument-room is 23 ft. by 32 ft. 6 in. and 15 ft. 6 in. high, with ample light and ventilation. Mr. Weatherley, of York, is the contractor for the work, Mr. John Plows acting as his managing foreman. Mr. Thomas Leake has acted as clerk of the works for the Government.

The Harbour Improvements, recently completed, are described in detail by the *Scarborough Daily Post*. The contract was let to Mr. J. W. Morrison, of Edinburgh, and the works were begun in January, 1879, but it was March before active operations commenced. The excavation of the harbour consisted of sand and boulders in great numbers, the work being done by dredging and by hand labour. The building of the piers was not begun till June, 1879, and a period of about eighteen months has been occupied with that portion of the work. The outer harbour has an area of 5½ acres, and has been deepened to an average depth of about 3 ft. 6 in.; in some parts over 5 ft. of earth has been removed. The inner harbour has an area of 9 acres, and has been deepened to an average depth of about 4 ft. The old dolphins, which occupied so large an area in both harbours, have been removed, and thirteen mooring-buoys have been substituted. These buoys are attached to large concrete blocks, sunk to a considerable depth below the new bottom of the harbours.

The quay walls of Vincent's Pier, having been undermined in the process of deepening the harbour, have been carefully underpinned. The west pier, which had a length of 500 ft., and which was only 27 ft. wide, has been lengthened and widened, and is now 740 ft. long and 70 ft. wide. This pier is formed of a face wall of Portland cement concrete, built in position, and filled in behind with materials obtained from the harbours during the excavating process. The concrete wall is about 23 ft. in height from foundation to cope, and is made of Portland cement concrete, consisting of Portland cement, obtained from London, of the highest quality, and gravel got chiefly from Cornelian Bay in cobles, and also from the shore beyond the Spa. In this concrete, blocks of stone were placed so as to form one solid mass. In some instances a mass of concrete, weighing about 300 tons, was made at one operation, and in no instance, it is stated, was any block made of less weight than about 100 tons. In order to provide a sufficiently wide entrance into the inner harbour, the Island Pier has been removed and a new entrance has been formed, 109 ft. in width, between Vincent's Pier and the circular head of the new pier. The construction of this pier was rendered a somewhat arduous operation, owing to the difficulty experienced in obtaining a sufficient foundation. The red clay, so common in this district, was found to lie at a depth of about 10 ft. or 12 ft. below the surface of the sand, and, as this sand was of a very watery nature, it was necessary to drive sheet-piling into the clay to enable the wall to be properly founded. The plans were prepared by Mr. John Howkins, M. Inst. C.E., of Edinburgh, and these have been carried out under the superintendence of the resident engineer, Mr. R. S. Wyld, Assoc.-Memb. Inst. C.E. The buoys have been supplied by Messrs. Alexander Shanks & Co., of London and Arbroath. The original estimate was about 13,000*l.*, but the total cost is expected to amount to between 16,000*l.* and 17,000*l.*

ON COMPROMISE BETWEEN CONSTRUCTIVE FITNESS AND TASTE.

SIR,—Before entering upon the subject of the above heading, perhaps you will permit me to say a few words in extension of several matters broached in my letter of January 1st. To say, as I did in that, that the beautiful is not a property of matter itself, may be true, but it is too wide of the immediate subject of discussion to be of much use. We must draw closer to our topic, and attempt some degree of precision in defining the beautiful. We may say, then, that the beautiful consists in a certain appositeness in the relations of form, colour, &c., to the perfectly-constituted eye; therefore, those things are alone beautiful which possess this appositeness to taste. There are discords as offensive to the eye as others to the ear, and the more opposed the combinations presented to either of these senses are to its constitution, to its taste, the more repulsive and disagreeable, or, in other words, ugly and dissonant, they are; consequently only some combinations in nature can be either beautiful or harmonious; and in animate nature creatures are beautiful in the degree in which their forms coincide with fitness of form to human taste.

But if the perfectly beautiful can only be that combination of relations which is in accord with true taste, we may reasonably infer that tastes of a lower degree of culture may be satisfied with less perfect combinations, and that such inferior tastes may have different and lower ideals. The diversities of taste, indeed, warrant such a conclusion, as do also the works representing the different steps of ascent in the several great art epochs. To descend a step lower,—to animal life,—we may conceive that each living creature, let it be as ugly and repulsive as it may, to man, has a sense of beauty after its own constitution,—after its own kind,—a notion rudely expressed in my previous letter; but truths must not be too smoothly enunciated if we desire to make men think.

The more immediate subject of my present letter is, however, according to promise, the discussion of category 5 in my last, viz., "On Compromise between Constructive Fitness and Taste." In my preceding letter I showed that *adaptation to purpose* is great creating Nature's principle of design, and that Art adopts the best course when she rigidly follows Nature in this respect. But as man professes to have an ineffable taste for the beautiful, it becomes a question as to the limits within which he may gratify it, or, in other words, as to how far he may seek to conform his surroundings to his own nature, to his taste. In my opinion, this tendency ought to be restrained within moderate limits. For in the numerous implements of utility we have attained to the perfect, the best, forms of those implements, when we shall have completely fashioned them to their purposes; they will not, however, as we have already shown, necessarily be beautiful. If, therefore, we were to attempt to serve two masters,—constructive fitness and taste,—we should in all probability, in a large portion of our manufactures, satisfy neither; if we materially altered their construction for the sake of taste, they would be less fit, and yet far short of what we would have them as works of art. The most that we could do, in order to effect a compromise with taste, would be to overlay them with surface ornament, which would not alter their general form. Would you have your steam-engines, your axes, your spades, your gun-stocks, your bayonets, your sword-blades, your cannon, &c., treated thus in order to further art culture? I think not,—for you will find that all this kind of overlaying and excess of ornamentation was never a characteristic of the great art epochs, nor the upshot of a healthy social and political life. A simple proportioned order, free from ornamental overlaying, and a beauty in the general forms of the immediate surroundings of life, were the characteristics of the Grecian art culture, and how favourably do these stand out in contrast with that fulsome overlaying with ornament which was the fashion during the periods of Louis XIV. and XV., a fashion promoted by an affectation of culture, and a morbid craze for forcing art upon everything.

We see, then, that the observance of the beautiful cannot be pushed too far in the manufacture of implements of utility, without running the risk of impairing their constructive fitness; but if the observance of the beautiful cannot be pushed very far in this direction, neither can it in very many works of fine art, for most historical works of art are hampered with conditions of portraiture, costume, &c., which are anything but beautiful. It is true that we may mitigate the worst features, and throw over all a glamour of colour, &c., and so "cook" the incident that taste shall not be mortally offended; but when all is done it will leave many works anything but works of abstract beauty. There is, perhaps, scarcely a single work of the Dutch school that could be pronounced beautiful; its productions have a certain characteristic harmony of their own, and exhibit a marvellous power over the technique. Rembrandt may be said, indeed, to be, *par excellence*, the exponent of the art of ugliness, of rendering the disagreeable palatable; he takes the ugliest objects and so wraps them round with a darkness visible,—an atmosphere so mercifully tender to ungainliness,—that the poor critic is cheated into the belief that he is contemplating the beautiful; whereas it is the dexterity of the compromise effected between taste and the offensiveness of the reality which effectually cozens him. Michel-angelo's aim, even, was not the beautiful, it was the grand,—that of the presentment of the human form instinct with power and mind. Raffaelle's was, in the main, the same, as that of all artists should be who aspire to treat the great themes of human thought, action, and suffering, wherein the beautiful can only occur as sparsely as in nature itself.

The architect, too, like the painter, is, in nine cases out of ten, bound by constructive conditions which he can at best but mitigate, and in some measure reconcile with taste. What an impulse would be given to architecture if every house-front might be treated as the architect willed, without fear of Building Acts or of district surveyors! We all very well know, however, that stories, lights, &c., must be conformed to certain regulations, and that a rigid adherence to law and their constructive fitness in our street architecture would reduce the metropolis to the aspect of one huge Poor-house. The architect is, therefore, obliged to effect a compromise between constructive fitness and taste, by ornamental applications, by columns, pilasters, cornices, &c., which have no constructive *raison d'être*,—by "shams"; and, however he may rail against "shams," he is compelled to present constructive fitness in masquerade. The engineer, however, does not feel bound to effect any compromise, and rigorously adheres to his constructive purpose, unless he should inadvertently invade the haunts of cultured mortals having an ineffable sense of the beautiful, or offend the eye of an æsthetic architect.

The principles we are endeavouring to expound may be tentatively expressed as follows. I say *tentatively*, for the subject requires very close thinking:—

1. Fitness to taste is rarely coincident with constructive fitness, either in nature or in art.

2. When constructive fitness should be paramount, it should never be impaired by any attempt at a compromise with taste.

3. When constructive fitness is the main aim, and yet admits of art being employed, the art should be conformed to construction.

4. When fitness to taste is the paramount purpose, construction should be conformed to fitness to taste.

5. The reconcilement of constructive or other conditions discordant to taste, with taste, is frequently the purpose of art, and constitutes the zone of compromise between the beautiful and the ugly.

6. Adaptation to purpose should be the leading motive in the design of all works of art. It is on the completeness with which purpose is fulfilled that art excellence depends, this excellence being ultimately estimated according to the degree in which it subserves the highest ends of humanity.

We come to see, as we think the matter out, that the various aims of art are, after all, but various manifestations of the principle of fitness: the *venus* only is changed, it is a fitness of a different kind to that of an implement, it is a fitness to our human nature, to either our judgment or our taste. We cannot conceive, indeed, of any creative motive, any motive of design, above that of adaptation to purpose. The undivided pursuit of either constructive fitness, or fitness to taste, is a clear course, but difficulties lie in the path of compromise.

It must be evident, then, that there are other aims in art than the presentment of the beautiful. The study of the *beau ideal* is but one specialty of the fine arts, an aim that an artist can only pursue within very circumscribed limits, in classical and abstract subjects, in the forms of some art objects, and occasionally in architecture. In monumental buildings constructive fitness may, with propriety, be subordinate to taste; adaptation to taste may be the leading motive, for where should art be paramount if not in such edifices? But we must first obtain an enlightened public opinion. Criticism has yet to learn its A B C. There must be more real culture instead of veneer, and clearer notions regarding the diverse aims of art, or our *dilettanti* will go near to wrecking, by their misleading, the manufactures of this country. It is not every one who is qualified to talk about art, though every one has the vanity to suppose that he is. In fact, the public should not listen to any one on art but an artist; just as they would not listen to any one on either surgery or engineering but either a surgeon or an engineer. Every artist would possibly not be perfectly correct in his teaching, but, at all events, he would be far less incorrect than any itinerant rhapsodical amateur.

W. CAVE THOMAS.

ON THE PROJECTION OF COLOUR THROUGH STAINED GLASS.

SIR,—A remark was made to me by a reader of your recent article on stained-glass windows, which it will be of some interest to have threshed out. The gentleman to whom I refer was speaking of the old glass at York Minster. He said that he was recently in the church, on a very bright day, and that his attention was called to the fact that the light which came through the old stained glass did not appear to be coloured in transmission.

Most of us will have observed instances of the tint thrown by stained windows on portions of church interiors, when the rays of the sun fall directly on the glass. I venture very respectfully to doubt whether the moon has sufficient power to throw such a stain, in spite of the classical passage in the "Lay of the Last Minstrel." In that beautiful verse, the great magician forgot that the motion of the moon is not, like that of the sun, so regular as to allow of the prediction of the manner in which she would cast a shadow at a given time,—at least, without an intolerable amount of mathematical investigation. So I take the liberty to hold that the entire idea of the projection of the "cross of red" on

the tomb of the mighty dead is imaginary. No doubt the poet assumes the well-known phenomenon as it occurs in sunlight, and poetically applies it to the moon.

However that may be, we are all acquainted with the fact that stained-glass windows transmit a coloured ray. The point now raised is, does glass lose that quality of transmission by age?—and, if so, in what way?

I am unaware of any observation on the subject, except that which I have cited. But it is not difficult for observations to be made. It will be of interest if any of your readers who have access to glass 400 or 500 years old will make the trial, and communicate the results to you. The idea entertained, as I understood my informant, by those who pointed out to him the phenomenon at York, was that it was due to some chemical peculiarity in the fabric of the glass. Assuming the accuracy of the observation, it occurs to me that the cause of the failure of transmission must be physical rather than chemical. On old window-glass the atmosphere has often exercised an erosive action. In many cases,—I can cite from memory the instance of Knowle,—there has been such a decay of the surface of the glass as to produce spectral colours when viewed by reflection. The same is the case with many articles of very old glass that have been long buried. The colours that are reflected from the surface of a sheet of glass cannot at the same time be transmitted. That we all know. We know that some objects made of glass appear of complemental colours, as viewed by transmitted or by reflected light. It seems to me possible that the surface of an old sheet of stained glass may be so honeycombed by age that it will reflect the greater part of the sun's rays, and not allow of the passage of enough light to produce a visible transmission of its own colour. As to that, however, the first thing is to verify the statement, the second is to explain it. I invite your readers to make communications on the first part of the subject. A CONSTANT READER.

MODEL BYE-LAWS:
HOUSES LET IN LODGINGS.

IT is not generally remembered that by section 90 of the Public Health Act, 1875 (38 & 39 Vict., c. 55):—"The Local Government Board may, if they think fit, by notice published in the *London Gazette*, declare the following enactment to be in force within the district or any part of the district of any Local Authority, and from and after the publication of such notice such authority shall be empowered to make bye-laws for the following matters (that is to say):—

(1.) For fixing, and from time to time varying the number of persons who may occupy a house or part of a house which is let in lodgings or occupied by members of more than one family, and for the separation of the sexes in a house so let or occupied.
(2.) For the registration of houses so let or occupied.
(3.) For the inspection of such houses.
(4.) For enforcing drainage and the provision of privy accommodation for such houses, and for promoting cleanliness and ventilation in such houses.
(5.) For the cleansing and lime-washing at stated times of the premises, and for the paving of the courts and courtyards thereof.
(6.) For the giving of notices and the taking of precautions in case of any infectious disease.

This section shall not apply to common lodging-houses within the provisions of this Act relating to common lodging-houses."

In the absence of any express limitation of their scope, bye-laws such as are authorised by the above-cited enactment would apply to every house or part of a house which, not being a common lodging-house, is let in lodgings or occupied by members of more than one family. But in many districts where the enactment is in force there are to be found houses which, though let in lodgings or occupied by members of more than one family, are of such a character as to render it inexpedient, if not absolutely unnecessary, to bring them within the range of bye-laws having for their primary object the regulation of premises where neglect of sanitary requirements might otherwise ensue. The Board have now issued a set of Model Bye-laws applying to houses so let, and to which attention should be given.

JOINERS' GLUE.

SIR,—I shall feel much obliged if some one will inform me, in your next issue, what will keep joiners' glue from turning mouldy, and from forming a fungus. I may say that I have tried oil of cloves, carbolic acid, salicylic acid, and spirits of wine, but all to no purpose.

A READER.

THE DESIGN OF THE GREAT PYRAMID.

SIR,—In reference to my letters on the subject of the design of the Great Pyramid, which you kindly published in the *Builder* of 16th June, 1877, and 22nd February, 1879 (where in the former "hands" should be substituted for "palms"), it may interest some of your readers to know that the measurements taken by Professor Piazzi Smyth in the passages of the Pyramid, and published by him in his 1880 edition of "Our Inheritance in the Great Pyramid," may all be converted into "hand" and "cubit" measure. There are a few measurements the consecutive differences of which give the exact value assigned for 10 cubits of 5 hands each (207 in.), determined entirely apart from Professor Smyth's measurements.

The following tabulated statements will show Professor Smyth's measurements, and the corresponding values of their differences, in the ancient measures, from which it will be seen that a very close agreement in nearly every case exists:—

Professor Smyth's measurements from the end of Grand Gallery to joints in masonry of ascending Passage.	Differences.	Value, as calculated from the absolute length of the "hand," viz., 4·14 in.	Value in Hands.	Value in Cubits.
Inches.	Inches.	Inches.		
385	32	33·12	8	10 cubits of 5 hands each.
417	175 } 207*	173·88 } 207	42 } 50	
592				
625	33	33·12	8	Ditto.
799	174 } 207*	173·88 } 207	42 } 50	
831	32	33·12	8	12 ditto, or 10 cubits of 6 hands each.
989	158	157·32	38 } 60	
1047	58	57·96	14	
1072	25	24·84	6	1 ditto.
1115	43	41·40	10	2 cubits of 5 hands each.
1152	37	37·26	9	
1191	39	41·40	10	
1230	39	37·26	9	
1268	38	37·26	9	
Totals...	883	881·82	213	

Professor Smyth's measurements from the end of the Grand Gallery to joints in masonry of Entrance Passage.	Differences.	Value, as calculated from the absolute length of the "hand," viz., 4·14 in.	Value in Hands.	Value in Cubits.
Inches.	Inches.	Inches.		
2009	46	45·54	11	4 Cubits of 6 Hands.
2046	54	53·82	13	
2100	36	37·26	9	1½ ditto.
2136	42	41·40	10	2 Cubits of 5 hands.
2178	60	62·10	15	3 ditto.
2320	82	82·80	20	4 ditto.
2375	55	53·82	13	
2417	42 } 207*	41·40 } 207	10 } 50	10 ditto.
2527	110	111·78	27	
Totals...	527	529·92	128	

With regard to the sums of the consecutive differences marked *, it may be as well to state that the diagonal of a rectangle which is twice as long as it is broad (from which the inclination of the passages must have been determined), will be approximatively equal to 50 units when its length is 44¾ and breadth 22⅜, and it seems highly probable, therefore, that these values of 50 hands were used for the purpose of obtaining the passage slopes.

I stated, in my letter of February 22nd, 1879, that I was inclined to the opinion that the Great Pyramid was designed so that the vertical height and the four corner heights represented approximatively the circumference of the circle described about the base, and that the Egyptian ratio for the circumference to the diameter was 977 to 311, derived from the limits ascribed to Archimedes; also that the Hindoo ratio of 3927 to 1250 was obtained from the same source. I have since discovered the processes by which these ratios were doubtless obtained.

The Archimedean limits ($3\frac{1}{7}$ and $3\frac{10}{71}$) represent very nearly the perimeters of the inscribed and circumscribed polygons of 96 sides; the greater limit is a little in excess, and the lesser a little below the truth; but it happens that the mean of these quantities gives the perimeter of the mean polygon to a much greater degree of approximation.

Now, the mean of the perimeters of the 48-sided polygons falls outside the Archimedean limits altogether, *i.e.*, it is greater than $3\frac{1}{7}$; therefore, in manipulating these limits it would be inferred that a ratio giving a result that should fall between the lesser limit and the mean of both would be likely to give a close approximation. The Egyptian ratio of 977 to 311 (difference 666 = the number of the Beast), and the Hindoo ratio of 3927 to 1250 (which was obtained from it, and which was probably also known to the Egyptians), can both be shown to fall within these limits; but as the methods of deducing these ratios would add considerably to this already somewhat lengthy letter, I have omitted them.

W. HAYDEN.

VALUE OF LEASEHOLD PROPERTY IN KING WILLIAM-STREET.

THE extensive leasehold premises in King William-street, in the City, occupied by Messrs. Mappin Brothers, the well-known cutlers and silversmiths, were offered for sale at the Auction Mart on Tuesday last, by Messrs. Debenham, Tewson, & Co., by direction of trustees. The premises were described as having a frontage to King William-street of 34 ft. in length, and covering a total area of 2,400 ft. The first portion of the premises was stated to have been rebuilt specially for Messrs. Mappin Brothers within the last fifteen years. They contain five lofty floors, with a basement containing extensive cellars and vaults. The auctioneer remarked that the property occupies one of the finest positions in the City, being at the junction of four of the principal main lines of traffic. The premises are held under separate leases from the parish of St. Swithin, London Stone, and the Corporation of the City of London respectively, for an unexpired term of thirty-three years, at a ground rent of 125*l.* per annum, and let by under-leases to Messrs. Mappin Brothers, for the whole of the vendors' unexpired terms, at a rental of 1,500*l.* per annum, showing a net profit rental of 1,374*l.* 10*s.* per annum, for thirty-three years. The particulars stated that the property afforded an unquestionably-sound investment, the security of the improved rental being fully assured by the important situation of the premises, added to which the very low ground-rent made the property quite exceptional, as it would be impossible to find a similar site held at so low a rate. The bidding for the property was of a very spirited character. The first offer was 10,000*l.*, upon which advances were made up to 17,000*l.*, at which sum the property was sold.

THE INTERNATIONAL WATER SUPPLY REFORM ASSOCIATION.

ENGLISH travellers have so often denounced the dangers of drinking-water in Continental hotels and towns, that the formation of an international society for the special purpose of calling the attention of the Governments of Europe to the quality of the water supplied throughout each country should meet with very general approval, at least among Englishmen. The *Lancet* says this society, though founded in Paris during the International Exhibition of 1878, may be considered to have only now commenced its first year of practical existence. The movement was originated by Mr. J. G. Jäger, director of the Amsterdam Water Company. The head-quarters of the society are in Paris, and its organ, the *Revue d'Hygiène et de Police Sanitaire*, is edited by Professor Vallin. Dr. F. de Chaumont, of Netley Hospital, and Mr. Edwin Chadwick, C.B., are among the members of the English committee. All per-

sons interested in sanitary reform are invited to join this association. For the present, it is among the smallest countries in Europe that the Association has met with the most success. We have seen that the King of Holland and the King of Belgium have lent their personal support, and now we learn that an influential Greek section has been formed, under the presidency of Dr. Bambas, and with the mayor of Athens as one of its active members. In France and Italy the Society has received a fair amount of support, but it still remains to be seen whether England will lend any efficient aid.

THE CAPABILITIES OF RENAISSANCE.

EDINBURGH ARCHITECTURAL ASSOCIATION.

THE usual fortnightly meeting of the Association took place on Wednesday, the 19th inst., in their rooms, Hanover-street, Mr. Bonnar, vice-president, in the chair. Mr. Andrew Dewar read a paper on "The Capabilities of Renaissance," and commenced by stating that every style went through four stages. Firstly, the Life of the style; secondly, the Renaissance or New Birth; thirdly, the Revival, or copying period; and fourthly, the Sepulchral, or Dead Stage, which, unfortunately, had more votaries than any of the others, as it required less thought and gave less trouble. In giving examples of each stage from examples in Edinburgh, the lecturer cited for the first, St. Giles's, Holyrood, and Trinity Churches; all very good Gothic, but great sufferers by iconoclasts, restorers, and Ruskin's horror,—railways. Of the second, meaning new birth in any style, he thought, with all due deference to Mr. Ruskin, the Scott Monument, for the time produced, one of the noblest conceptions of the human mind, telling as it does with undying authority that the too-much-forgotten name of George Kemp has only one rival in Britain,—Sir Christopher Wren. The New University, a good example of Italian Renaissance; the Old College, a commendable medium between Renaissance and Revival; the High School, a masterly treatment of Greek; the Bank of Scotland, David Bryce's masterpiece; the Assembly Hall spire, a worthy rival to that of any English cathedral. Of "Revival," the third stage, we are unquestionably so rich there is not the slightest necessity for architects supplying the city with any more, as copies of ancient architecture are expensive and detrimental to the progress of art. Of these we have the National Galleries, Surgeons' Hall, Commercial Bank, Burns and Melville Monuments, St. John's Church, &c. Nor would Edinburgh be a typical British city if it did not possess magnificent works of dead art. In the *wooden style*, that supreme milk-churn, Nelson's Monument, and the German combination puzzle and toy the Calton Jail; the Martyr's Monument as an Egyptian obelisk. In Gothic, that panorama pasteboard screen, Free Church College; and in Classic, all the Established Churches of the city.

After showing how Renaissance degenerated and forestalled the science of to-day by developing Darwinian monsters, *et hoc genus omne*, out of foliage in the fifteenth century, it was suggested that as no new style was considered possible now, and what we had was more than enough to suit every requirement, architects should confine themselves to a true Renaissance or New Birth of that style which was most suitable for the building about to be erected.

FIRES IN LONDON.

THE report of the chief officer of the Metropolitan Fire Brigade, Captain Shaw, on the state of the brigade and the fires in London during the year 1880, just now issued, shows that the number of calls for fires or supposed fires received during the year has been 2,194. Of these 206 were false alarms, 117 proved to be only chimney alarms, and 1,871 were calls for fires, of which 162 resulted in serious damage, and 1,709 in slight damage. The fires of 1880, compared with those of 1879, show an increase of 153; and, compared with the average of the last ten years, an increase of 224.

This being his twentieth annual report, the chief calls attention to some points of interest and curiosity in connexion with the statistics of the establishment.

Taking the fires during the past year by months, the greatest number has been in May (namely 219), and the smallest in February (104). Taking them by weeks, the greatest number has been in the twentieth week (63), and the smallest in the twenty-fourth week (18). Taking them by days, the greatest number has been on Saturdays (289), and the smallest on Tuesdays (253). Taking them by hours, the largest number has been between nine and ten p.m. (182), and the smallest between seven and eight a.m. (31). The figures for the months, weeks, and days for the last twenty years, although on the whole not varying materially, have at certain periods undergone considerable fluctuations, but those for the hours are quite constant, the largest number being between nine and teno'clock at night, and the smallest between seven and eight o'clock in the morning. After six in the morning, fires increase slowly and irregularly until about five in the afternoon, and between five and ten very rapidly, attaining their maximum at the latter hour. After ten at night they diminish rapidly and regularly until about six in the morning, when, as already said, they are at their minimum.

FIRES IN THEATRES.

IN the year 1880 the following theatres were completely destroyed by fire:—

Jan. 10. *Waco*, Tex., U.S.—Miller's Theatre.
Feb. 9. *Dublin.*—Theatre Royal.
Feb. — *Pordenone.*—Teatro della Stella.
Feb. 15. *Huddersfield.*—Theatre Royal.
Feb. 20. *Rostock.*—Stadttheater.
Feb. 23. *Brewsters*, N.Y., U S.—Theatre in Town Hall.
April 2. *Bradford*, Penn, U.S.—Academy of Music.
April 10. *Petroleum* City, Penn., U.S.—The Opera House.
April 27. *Belleville*, Ont. — The Opera House.
April 30. *Temesvar.*—Franz Josef's Theater.
May 9.—*Liège.*—Théâtre Vauxhall.
May 14. *Milton*, Penn., U.S.—Academy of Music.
May 26. *Lyons.*—Théâtre des Célestins.
July 4. *London.*—Duke's Theatre.
July 8. *Tyrone*, Pa., U.S.—The Opera House.
July 12. *Perpignan.*—Théâtre des Variétés.
July 22. *Sidney.*—Victoria Theatre.
Aug. 17. *Eureka*, Nev., U.S.—The Opera House.
Aug. 19. *Sunderland.*—Lyceum Theatre.
Sept. 3. *Hart's Fall*, N.Y., U.S.—The Baker Opera House.
Oct. 12. *Chicago.*—Emmett's Academy of Music.
Dec. 2. *Topeka*, Kan., U.S.—Crawford's Opera House.
Dec. 9. *St. Louis.*—Théâtre Comique.

A. F.

HOUSES AND OWNERS.

SIR,—Public attention is being directed in many ways just now to the unsanitary state of our houses, notably by lectures before various societies, letters by scientific men, papers read at the Society of Arts, and perhaps, not least, by the endeavours to establish a Sanitary Assurance Association, and the result of two sewer cases recently tried in the law courts; yet those who design and build dwellings give little heed to the stir thus created, and structures utterly unfit for habitation are being erected by hundreds, thus enhancing the propagation of an already long list of diseases, in defiance of the law, which at the best is only set in motion in a half-hearted and timid manner, ending in disappointment to those who seek redress against reckless owners.

I have no desire to ventilate any private grievance as such, but in the interest of a large section of the community I am justified in stating the circumstances of a *bonâ fide* case of sanitary neglect within my knowledge, which is a fair example of the conduct of a very large number of a certain class of landlords (landlords they are not, but only quasi-owners of the bricks and mortar) to be found in and round London.

A friend of mine took a villa in a near suburb for three years; it was looked on by a surveyor, and, so far as ascertainable, appeared tolerably sound, though slightly built. Every assurance was given by the owner that the drains and water supply were in proper order; nevertheless, within a year the roofs leaked all over; the closets and cistern proved very defective, the latter leaked for many weeks; the patent guaranteed feed-cistern, the pet of the water company, collapsed; two ceilings fell in, rendering one room dangerous and blocking another up. This is enough, but I could add many other items.

The family, hitherto healthy, now suffered from diphtheria, diarrhœa, rash, and scarlet fever, which the doctors attributed to the drains and water. Complaints were duly made, with but little permanent good; the landlord was indifferent, the sanitary authorities tardy or helpless, and the water company apathetic,—they made a slight fuss, which died out. Of course the landlord demanded his rent as usual, and on the tenant, during his illness, refusing to pay unless something substantial was done, the brokers were, without notice, put in, thus greatly aggravating the tenant's sufferings, though you may well imagine the "visitors" did not remain many minutes.

It has taken just two years and a half to force the landlord to partially remedy some of the defects; still, at the present moment, one closet would be as useless, and the roofs cruelly leaky, even if the weather was mild; as it is, there has been no water in the house at all for eight days, the pipes and closets are completely frozen up, so badly are they constructed and situated. But I do not complain so much of what the weather causes as of the unhealthy state of the house for twenty-nine consecutive weeks out of fifty-two, without any reason whatever.

Some people will say, why did not the tenant leave? Well, sir, the fact is, he intended to take a lease ultimately, and on occupying, expended on the garden and house improvements more than 100*l.*, the benefit of which would have wholly lapsed to the owner in the shape of added rent on a new tenant coming in, and so he struggled with the difficulties, thinking in the end to succeed; but there appears no hope.

A little more yet to tell. The reputed owner of the property, representing a rental of over 500*l.* a year, is a most illiterate man,—a little builder without premises, who lives from house to house, and on that account applies to be excused from paying rates and taxes. There is, however, a man behind the scenes, an eminent architect, so rumour says,—at least, he adds F.R.I.B.A. to his name,—and is a district surveyor, so that ignorance of construction cannot be pleaded, but rather a charge of wilful and disgraceful neglect is justly merited. It is thought that the property, if not belonging really to this architect, does to a well-to-do company, who could have no excuse for good houses being kept in a dilapidated state on the score of poverty. Then why are they so?

Every reader can easily see a moral to this cry, but can any one point out a remedy for such a state of things, or show a tenant how an owner is to be brought to his senses, and avoid the necessity of moving, always a costly procedure? If so, thousands will be grateful; but let me, in conclusion, say that, as a rule, it is useless to call in the sanitary inspectors,—builders easily defy them; nor is it much better to trouble the water companies,—it is only big leaks and increased rentals they care to look after.

It seems to me that the law should be altered which now gives a landlord power to distrain, whether the premises are habitable or not. In all other business transactions you only pay for value received, and why should a tenant pay for a house neither wind nor water tight, but a fever-trap, in every sense of the word?

All success to the Sanitary Assurance Association, which, if properly worked, may be a boon to every tenant.

SANATORIUM.

A COURSE OF STUDY.

SIR,—Having recently come from the East, with the intention of studying and gaining a practical knowledge of architecture as carried on in England, I should be glad to be informed, through the medium of your journal, how my end can be accomplished without following the ordinary course of procedure, *i.e.*, by being articled to an architect for a term of years and payment of a premium?

I may add I am a constant reader of the *Builder*, and I have been led to write this owing to an article in your issue of the 25th December, entitled "The Architectural Profession in England and Germany."

AN EAST INDIAN.

*** Some of our correspondents may, perhaps, be led to give the writer their opinions on the inquiry he makes. The subject is interesting.

THE INSTITUTION OF CIVIL ENGINEERS.

THE Council of this society have made arrangements for the reading and discussion of the undermentioned students' communications at seven o'clock on the following Friday evenings, viz. :—

Feb. 4th,—"Boilers," by Wm. Marriott.
Feb. 11th.—"The Internal Corrosion of Cast-Iron Pipes," by Matthew Buchan Jamieson.
Feb. 18th.—"The Roade to Northampton Railway," by John Edward Waller.
Feb. 25th.—"Sewer Work," by Robert Henry Thorpe.

The chair will be taken successively by Mr. Bramwell, Mr. Rawlinson, C.B., Mr. Bruce, and Sir Joseph Bazalgette, C.B., members of Council. It is stated that out of the Miller Fund,—which was bequeathed by the testator for the purpose of forming a fund for providing premiums or prizes for the students of the Institution,—the Council are prepared to award one scholarship in each year, not exceeding 40*l.* in value, and tenable for three years, if a paper of adequate importance is received, as well as Miller prizes for other approved communications. Also that a second series of meetings will be appointed if a sufficient number of suitable papers are received.

THE PONTEFRACT TOWN-HALL SCHEME.

The Town Hall Committee of the Corporation, under the presidency of the Mayor, met on Monday evening for the purpose of opening the seals of the authors of the numerous plans sent in for the additions to the above. The author of the design, "Straight and True," to whom the first premium of 50*l.* will be awarded, is Mr. Perkins, of Leeds; and, of course, he will be entrusted with the carrying out of the work. The second premium was awarded to Messrs. Roper & Brown, of Manchester,—motto, "1880."

SOIL PIPES AND FROST.

SIR,—Lately I have noticed a letter or two upon this subject; the one I wish to point at is that recommending soil-pipes to be fixed outside. I am told that the person recommending these pipes outside is a plumber. If so, will he call upon me at No. 2, Shaftesbury-terrace, Warwick-road, Kensington, and I will show him my journal, which will, I think, convince him of his mistake, unless he wants to make work? I have had to send men to no less than fifty-three different soil-pipes frozen up in and about London, especially about Kensington; or if he does not like to come to my house I will send him a photograph of No. 158, Cromwell-road, Kensington, where there is at this moment a soil-pipe having, at least, 5 cwt. or 6 cwt. of ice lovingly clinging to the walls, and to this charming outside pipe. The following is a list of pipes removed from outside to inside within the last twelve months:—Six houses in Addison-road, four in Holland-road, two in Melbury-road, one in Holywell-street, Strand, two in Bridge-road, Hammersmith, and now I have received an order to remove the greater part of those which I have had trouble with this winter. I am no advocate for stopping work, but I certainly do think that such men as place these pipes outside should at least case them after they are fixed, or be made to unstop two or three before breakfast during this weather. As to the fact that soil-pipes are placed outside as a sanitary point of view, this should not for one moment be entertained. Let the soil-pipes be of good stout lead, with properly-made joints and well ventilated: everything will then be done that any sanitary engineer can wish for. But to fix pipes outside without a bit of casing or other protection is against all the rules of sanitation, unless I misunderstand the word. Is not a soil-pipe something pertaining to or designed to secure health? Then how can you secure health by fixing soil-pipes in such a manner that they become blocked for weeks together?

P. J. DAVIES, C.E.

P.S.—*The Yankee System for Hot-Water Tanks.* I have to-day seen the effect of a boiler explosion resulting *from the one-pipe system.* The circulating tank was fixed in the kitchen, the draw-off to the bath and air-pipe above became frost-bound, and also the cold-water supply shortly afterwards froze up; there was a draw-off to the scullery sink from the flow-pipe, this took the water away from tank and top part of boiler. Steam was generated which blew the circulating tank to pieces. This system is to do away with the open circulating tank and the long length of flow and return pipe, but unless fixed so that it cannot be empty it is very dangerous, and should be condemned by Act of Parliament.

P. J. D.

A PERSONAL EXPERIENCE.

SIR,—As a working man living in a small town, and for nine years a subscriber to the *Builder*, and a reader of it, allow me to express my gratitude to those gentlemen who read such valuable papers as you print, on subjects calculated to improve the health of the people. Nine years ago I took the house in which I now live. The people who occupied it before had a serious break out of fever, resulting in one death, and the man that repaired the house died of the same disease. Finding this out after I took the house, I was somewhat alarmed, having two young children; but from the reading of the *Builder* I gathered there must be a cause, and the smells arising from the sink led me to pull the pipe up. There I found the sink-pipe connected to the closet soil-pipe leading to the cesspool, with no trap or anything to stop the sewer gas or air, and this in a back kitchen with a bedroom over it, and no fireplace or chimney, or any outlet for the sewer-gas that went up through a trap-door into this bedroom. I took up the lead sink-pipe, had it trapped, put a bell-trap on the top as well, and am pleased to say, with other knowledge I have gathered from your paper, with a family now numbering six children, I have had scarcely any sickness; but who can wonder that disease and death were the result of such a state of things as before existed?

I was surprised by the long discussion that went on some time ago with workmen as to the best means of education, in your paper, that neither of the writers seemed to be aware that the very channel in which he was expressing his grievances was the very source of a great deal of everyday education which applied to his own home, and, if made known to his wife as well, saves him many wakeful nights and losing quarters in the morning. For who can tell the loss, both mental and physical, to a man who has a fever in his family for ten or twelve weeks, with perhaps one or more of his dear children carried off, which loss must also be sustained in part by his employer? If, then, sir, my fellow working-men would take in the *Builder* and read it at home, then, like your humble servant, they might understand all the articles that appear therein. They would find their money was well spent, though it may be a fourpenny paper, which, I am sorry to say, seems to frighten some working men.

JOSEPH H. BARFORD.

THE SURVEYOR'S PROBLEM.

SIR,—In your issue of last week, your correspondent, "E. L. G.," asserts that the area found by myself is over the true value, which he says is very near 5331. With your permission, I will show him that he is wrong, not only in the above assertion, but in another, for reading further on I note, "The simplest way of expressing the area was by

$$A C \cdot D E = (87 + \sqrt[3]{14^2 \times 87}) \sqrt[3]{87^2 \times 14}."$$

Allow me to inform him that the simplest expression for the area is

$$87 \times 14 + \sqrt[3]{87^5 \times 14}$$

And at the same time I will show him how I found the area from this, and shall be glad if he will point out any error in my work.

5 times log 87 =	9·6975965
add log 14 =	1·1461280
result =	10·8437245
One-third of above log =	3·6145748
= log	4116·94
Add 87 × 14 =	1218
Area =	5334·94

This result is exactly the same as I gave in my preceding communication.

Since writing the above, I have detected a serious error in "E. L. G.'s" work, for 112·739 × 47·321 = 5334·922219, and not 5330·923, as found by him.

J. G. VINE.

FEEDING LOCOMOTIVES.

SIR,—In the course of your article on the London and North-Western Railway, in the *Builder* of the 8th inst., allusion is made to Mr. Ramsbottom's method of feeding locomotives whilst running. Will you allow me to point out that the plan is really of American origin, a patent having been granted to Mr. Angus W. McDonald, of New Creek Depôt, Virginia, on the 28th of November, 1854, whereas Mr. Ramsbottom's patent bears date June 23, 1860? The invention was fully illustrated in the *Scientific American* of January 13th, 1855, from which it will be seen that the essential principle of Mr. Ramsbottom's invention was made public more than five years before the date of his patent. The progressive stamp duties were duly paid, and the patent ran its full course of fourteen years, which we must suppose would not have happened had the inventor been aware of Mr. McDonald's plan. The case is instructive, as showing the slowness with which information of a certain kind becomes disseminated.

RICHARD B. PROSSER.

The Patent Office.

DECISION UNDER THE BUILDING ACT.

MR. STEPHEN HAYWORTH, of Kingsland High-street, was summoned to Worship-street by Mr. Alexander Payne, the District Surveyor for East Hackney South, for penalties for neglect in giving notice, and also for irregularities said to have been committed in the reinstatement after fire to the premises, No. 100, Lauriston-road, South Hackney. The District Surveyor contended the repairs were alterations affecting the construction of the external and party walls, and within the meaning of the Act. The defendant, through his solicitor, Mr. Hazeldine, argued that the repairs were merely necessary to reinstate the premises to their original condition, and that no part of the building had been in any way altered or added to.

Mr. Hannay, after looking into the Act and the cases, decided that, as the defendant had not in any way interfered with the external or party-walls to alter the same, but had merely repaired the portions burnt as they were before, such repairs did not come within the meaning of the Act, and thereupon dismissed both summonses.

STAINED GLASS.

Wyke.—A stained-glass window has just been erected in Wyke Church, Yorkshire, dedicated to the memory of the late Rev. C. W. Houlbrook, formerly vicar of the parish. The subject is Peter walking to Jesus on the sea. The window is by Messrs. Powell, Bros., of Leeds.

Halifax.—The Wesleyan Church of St. John has received an addition, in the shape of a stained-glass memorial rose-window, by Messrs. Powell, Bros., of Leeds. It contains four large figure subjects, viz., the Calling of Samuel, Solomon building the Temple, Christ blessing little Children, and St. Paul preaching at Athens. The wall-space beneath the window has also been decorated by the same firm.

Hemingbro'.—A memorial stained-glass west window has just been erected in Hemingbro' Church, near Selby, Yorkshire. The subject, which occupies the whole of the five lights, is the Crucifixion. Immediately below the Saviour on the cross are the Virgin Mother and St. John. More in front, at the foot of the cross, is the kneeling Mary Magdalen. Other groups, including mere spectators, occupy the other four lights, of which, on either hand, the most salient figures are two soldiers, one grasping the spear, the other the reed. The next in prominence are the other Mary, the centurion, and Joseph of Arimathea. In the outer lights, on our Lord's right, the chief group is of soldiers casting lots for the coat woven "without seam," and on the left a soldier, with a box of nails, hammer, and tools. The towers, walls, &c., of the city are visible in the background, surmounted by a canopy, in which are figures of adoring angels. The tracery-lights above the canopy include figures of the four greater Prophets, the four Evangelists, and witness angels. In the treatment of this window it has been sought to reproduce the characteristics of the celebrated York Minster glass. An inscription on brass at the base states the window to have been erected in memory of the late Mr. John Banks, of Howden Hall, his wife, and one son, by surviving members of his family. This window is also by Messrs. Powell, Bros.

Local Board for the District of Acton.—Mr. Henry Monson was unanimously elected Assistant Surveyor to this Board at their meeting on the 11th inst., at a salary of 150*l.* per annum. There were ninety-one applications for the office.

CHURCH-BUILDING NEWS.

Frimley (*Surrey*).—The church here, having recently undergone extensive improvements, was re-opened by the Bishop of Winchester a week or two ago. It is a structure erected in the dark days of Gothic architecture, and is a parallelogram, having a shallow recess at the east end as sacrarium, while at the west end is a tower, with vestry on one side, and staircase lobby on the other, galleries being placed round three sides of the interior. The works were commenced by the insertion of a new east window, now filled with stained glass by Messrs. Powell. Below this is an arcaded reredos, of Caen stone, with columns of Devonshire marble, the three central panels being of alabaster, having a cross in the centre, and vine and corn in the side panels, carved by Boulton, of Cheltenham. There is a new chancel arch, having also Devonshire marble column-shafts and a pinnacled frontispiece towards the church. The plaster ceiling has been removed, and a wooden one slightly raised, and stained and varnished, substituted for it. The galleries have been cut back, reseated, and a new open arcaded front erected all round. New seats have been placed in the body of the church, and choir-seats, pulpit, and desk of oak complete the eastern end. The works so far have been carried out by Mr. J. Harris, of Woking, from the designs and under the superintendence of Mr. Thomas Goodchild, architect, of the Adelphi, London.

Kilmasdon (*near Radstock*).—The chancel to this fine and interesting Perpendicular church has been nearly rebuilt lately, and a new organ-chamber added at the south side. The old roof was a perfectly flat lath-and-plaster one. This has been entirely removed, and a handsome new English oak-panelled roof put in its stead, with elaborate traceried principals and tie-beams,—a roof of such a description as doubtless existed in Mediæval times. Externally the chancel and new organ-chamber have been covered with lead, and the old parapet rebuilt as far as practicable. A new east window of suitable character replaces the debased modern one. The cost of the work has been entirely defrayed by Lord Hylton. Messrs. F. & G. Brown, of Frome, were the builders, and Mr. Edmund B. Ferrey the architect.

DISSENTING CHURCH-BUILDING NEWS.

Levenshulme (*Manchester*).—The foundation-stone of a new Congregational church has been laid at Levenshulme. The church is being erected upon a site adjoining the present school, and is 64 ft. long by 43 ft. wide, and 49 ft. to ridge of roof. Two vestries are placed on the south side. A spire will stand at the north-west angle, the lower stage of which forms the principal entrance to the church, opening into a vestibule, which occupies the entire length of the front. Internally the fittings will be of pitch-pine, accommodation being provided for 400 persons. Provision will also be made for the erection of a future gallery, to contain 100 additional seats. Increased class-room and other accommodation will also be provided in connexion with the present school. The total cost will be about 3,300*l*. The building is being carried out under the superintendence of the architect, Mr. John Lowe, Manchester; Mr. W. W. Harrison, also of Manchester, being the builder.

Hucknall Torkard.—The Wesleyan chapel here is nearing completion, and is likely to be a conspicuous object. It is Gothic in style. Mr. Councillor J. Wills, of Derby, is the architect, and Mr. J. Munks, of Hucknall, is the builder.

Greenock.—A new Wesleyan church is to be built in Ardgowan-street, on the same site as the present. The architect selected is Mr. J. Wills, of Derby, and the works are to be put in hand at once.

Eltham.—The opening services of the Bible Christian Chapel took place on the 13th inst. The building is Gothic in style. The front is faced with red bricks, pointed in blue ash mortar, and has a large five-light window, stone mullions, &c., and filled with tinted glass, the tympanum being filled with diagonal bricks and terra-cotta tiles. The sides are in stock bricks, with red bands and arches. The building is covered with Broomhall tiles. The open benches are in pitch-pine, and the rostrum (part ornamental) is of the same material, but polished. The works have been well executed by Messrs. Watts & Davies, builders, of Foot's Cray, Kent, Mr. W. Theobalds, London, being the architect.

Books.

Duty: with Illustrations of Courage, Patience, and Endurance. By SAMUEL SMILES, LL.D. London: John Murray. 1880.

WHEN 14,000 copies of a book are subscribed for at the publishers' trade dinner, as we have heard was the case in respect of Dr. Smiles's new book, "Duty," the author must be in little need of commendation. Dr. Smiles, by the production of "Self-Help," not to mention the "Lives of the Engineers," "Character," "Thrift," and many other books, has created for himself an immense public anxious to read anything he writes. "Self-Help" has been translated and published in nearly every European language, and has suggested effort and given confidence to thousands of men and women. Like many other popular books, it was declined by the London publisher to whom it was first offered; but the author fortunately became acquainted with Mr. Murray, who, with his usual *acumen*, at once saw its value, and produced the book.* "Character" and "Thrift" belong to the same series, and now "Duty" completes it. This is a charming little volume, full to overflowing with anecdotes of the well-doing of the good and brave. Dr. Smiles holds that "Great deeds are great legacies, which work with wondrous usury. By what men have done we learn what men can do. A great career, though baulked of its end, is still a landmark of human energy. He who approaches the highest point of the supreme quality of Duty is entitled to rank with the most distinguished of his race."

It must not be regarded, however, as a mere compilation,—bundles of anecdotes brought together *pêle mêle*,—a monument of industry even from that point of view alone. They are tied together with much literary skill, and the author is heard throughout to a good purpose. Dr. Smiles deserves well of his country.

VARIORUM.

"KENNA'S Kingdom: a Ramble through Kingly Kensington, by R. Weir Brown (David Bogue, 1881)," is a pleasant little book, and will lead some to feel an interest in the district who have not already made acquaintance with the better books on the subject that exist. It gets its catchpenny title from Tickell's foolish poem, "Kensington Gardens," wherein is told the fiction of

"Kenna! that gave the neighbouring town its name."

Which he didn't.——"The Lincoln Pocket Guide, being a short Account of the Churches of the County, and of the Cathedral, by Sir C. H. J. Anderson, bart.," is published by Stanford, of Charing cross. The title-page bears as a motto the well-known two lines of Byron's:—

"'Tis pleasant sure to see one's name in print;
A book's a book, although there's nothing in't."

This qualification, however, is quite unneeded in the present case. The Lincoln Pocket Guide is full of information conveyed in the most pithy manner. Sir Chas. Anderson is a most accomplished antiquary, and the travelling public have reason to be very thankful that he has provided for them such a good little hand-book.——"Dickens's Dictionary of Days, an Every-day Record of 1880," gives a concise history of the principal events which occurred throughout the world in that year. It is the first of what will, doubtless, become a valuable series. A daily report of the weather in London, state of the barometer, &c., is a good feature. "Dictionary Dickens" is becoming a distinctive designation.——"Streets' Indian and Colonial Mercantile Directory for 1880-1" (30, Cornhill) has been still further improved. In addition to the trade returns, tariffs, populations, &c., the present volume contains full particulars of the steam and other communications with the various places treated of. The leading merchants and traders of every class, likely to be of any use to manufacturers and all engaged in commerce, are fully enumerated; and concise descriptions of each country and town are furnished, with maps. In the present edition the names of the chief towns, the principal products of the different countries and similar information, have been alphabetically arranged, so as to facilitate reference. The volume has immense interest in our eyes. It purports to be a Mercantile Directory, but it is something more. It serves to convey to the mind the number, extent, and actual condition of our enormous dependencies with such vividness and realism, so to speak, as no ordinary history could effect.——Laxton's Price-Book is "fatter" than ever. The edition for 1881 (the sixty-fourth) "revised to meet current rates," contains additional matter, including a section devoted to sanitary work,—a sign of the times, we may hope. Some observations in the preface as to the considerations which have influenced the prices given should be well understood by those who adopt them.

* We have always felt a personal interest in this work. Before the publication of it the conductor of this journal had made considerable collections, and had commenced the production of a book on precisely the same lines. A part of it was delivered as a lecture at, amongst other places, the Architectural Museum, when located at South Kensington, and was afterwards published by the late Mr. Hardwicke, Piccadilly. It was entitled "Memorials of Workers: The Past to Encourage the Present," by George Godwin; and bore as motto on the title-page,—

"Go, breathe it in the ear
Of all who doubt and fear,
And say to them, 'Be of good cheer.'"

The appearance of Dr. Smiles's admirable volume rendered further progress undesirable.

Miscellanea.

The Electric Light in the House of Commons.—Mr. D. Grant on the 13th inst. asked the First Commissioner of Works whether any steps had been taken to test the electric light, and its fitness to illuminate the House, and with what results. Mr. Shaw-Lefevre replied that a few days before the meeting of Parliament experiments were made in lighting the House by the Anglo-American Company with the Brush system of the electric light; six globes were placed a few feet below the roof of the building. On personal inspection he concluded that the glare of light was a great deal too strong, and he could not recommend it to the consideration of the House. The company had since offered to make further experiment by placing the light above the glass roof, and he proposed to try it some Wednesday afternoon.

English and Irish Acres.—In Ireland, although properties are sold in the Landed Estates Court and by private sale by the English or statute acre, lands are let and rents are quoted at over almost the whole country by the Irish acre. As five Irish acres are equal in extent to eight English acres, it follows that when an Irish farmer says he pays 1*l*. per acre, he means that he really pays 12*s*. 6*d*. per English acre. In the midland counties of Ireland a very common rent for fair average arable land is 32*s*. 6*d*. per Irish acre,—equal to 20*s*. per English acre. This will explain somewhat the nominally high rents we hear of in Ireland. When we hear of prime feeding grassland being let at 4*l*. per acre, it only means, to an Englishman, 50*s*. per acre.

Church's Suction Top and Ventilator.—Although the principle is the same in all such cowls, some, of course, are better than others. Mr. Church claims that his "suction-top" obviates objections to be found in others, though possessing a much larger vacuum-chamber or head space, whereby a stronger "suctionary power," together with five large openings instead of only one, combined with a scientific arrangement of flats and rounds, obtaining a threefold action, and is affected with a gentle breeze. We hear it well spoken of, and shall be quite correct in saying that those who go to Church to get a cowl are not straying into improper paths.

Boiler Explosions.—Attention has been called lately by several explosions to the present construction of kitchen-boilers, which manifests its defects frequently with lamentable results, when anything interferes with their ordinary working conditions. Messrs. J. C. Stidder & Co., say,—"We have for some time past devoted much attention to the subject, and have succeeded in producing an efficient safety-valve. Of these valves we have already circulated a large number,—they are attached to the ordinary draw-off taps of the boiler, and any increase of pressure therein never fails to actuate the valve, which allows the superfluous steam to pass harmlessly away. The valve and tap combined are very inexpensive, and in no case has any boiler exploded to which they have been attached."

Church High School for Welsh Girls.—On Wednesday last the Venerable Archdeacon Smart formally opened the North Wales Church of England High School for Girls at Rhyl. The school has been founded on a broad basis.

Fires.—A few evenings ago a fire was discovered in one of the upper rooms of Her Majesty's Theatre, and the building seems to have narrowly escaped the fate of its predecessor about thirteen years ago. The room in which it broke out is occupied as a wardrobe-room, and the fire is attributed to the overheating of a furnace-flue running up from the basement to the top of the building. The timely use of one of the hydrants fixed within the building rendered the services of fire-engines unnecessary; but the damage suffered by the wardrobe was about 500*l.*——We also record with regret that early on Saturday morning a fire took place at the metal-work factory, No. 112, St. Martin's-lane, belonging to Messrs. J. & E. Gardner, lamp manufacturers, West Strand. The premises were completely gutted, hardly a vestige of tools or machinery being recognisable. The whole of the stoves and fittings for the new Leathersellers' Hall, valued at 1,450*l.*, and the metal work for Messrs. Howell & James's new premises and for Forfar Episcopal Church, are among the finished work destroyed. The total loss, exclusive of the building (belonging to the Salisbury estate), amounts to about 7,000*l.*, only 1,500*l.* being covered by insurance.——Early in the morning, on the 21st, the large mission church at Richmond was burnt to the ground. The volunteer fire brigade were in attendance, but their efforts were powerless to extinguish the flames. This is the second place of worship that has been destroyed in Richmond during the week, the new Wesleyan chapel, erected at a cost of several thousand pounds, having been consumed by fire on Tuesday week during the height of the gale. Both fires are attributed to over-heating.

The International Medical and Sanitary Exhibition, 1881.—This Exhibition, which has now been definitely entered upon by the Committee of the Parkes Museum of Hygiene, will be held at South Kensington from July 16th to August 13th, inclusive, her Majesty's Commissioners of 1851 having granted space for it in their Exhibition buildings. The Medical Congress, which holds its seventh session in London in August this year, has given its cordial support to the undertaking, but the Exhibition Committee have decided not to make any appeal to the medical profession to join in the guarantee fund, on account of the heavy expenses which the members of the profession must incur in connexion with the Congress. All who are interested in the progress of medical and sanitary science are appealed to to subscribe to the guarantee fund, of which the first list, amounting to 655*l.*, has just been published.

The Sanitary Engineering and Ventilation Company, of Victoria-street, Westminster, whose "Imperial" ventilating tubes and fixed exhaust ventilators are well known, has lately introduced a modification of their patent air-cleansing water-box in combination with a handsome wall-bracket, for drawing-rooms and boudoirs, &c., and which seems to possess every possible advantage. The bracket (which is designed either for a flat wall or a corner) is made large enough to carry a bust, a vase of flowers, or other ornament, behind which the current of purified air ascends vertically, and without damage to the ornament or to the decoration of the room.

City and Guilds of London Institute.—We willingly help to make known that during the spring term, commencing January 24th, 1881, Professor Armstrong, Ph. D., F.R.S., and Professor Ayrton, A.-M. Inst. C.E., will continue their tutorial and laboratory courses of instruction in chemistry and physics as applied to the arts and manufactures, at the Cowper-street Schools, Finsbury, in rooms rented from the Middle-Class School Corporation, pending the erection of the City and Guilds Technical College, Finsbury. Detailed information may be had at Gresham College. The fees are very light.

Royal Academy.—Last week, Mr. Frank Dicksee and Mr. Hamo Thorneycroft were elected Associates. On this Friday (28th) three other vacancies in the list of Associates will be filled up. As it is more than possible that one of the vacancies will be filled by the election of an architect, we cannot refrain from expressing an earnest hope that a representative of the great art and science of architecture as a whole may be found in the list of candidates and elected, rather than a devotee to some small portion of it. Failing such a man, Classic architecture greatly needs a proper representative in the Academy.

Smoke Prevention.—Mr. A. C. Engert, who made some brave attempts not long ago to improve the acoustic qualities of rooms, has patented a system of smoke prevention, and has applied his invention to domestic fire-grates. The principle involved is that of consuming the gases arising from the warmed coal before they can be condensed and converted into smoke by coming into contact with the cold air. To this end the fire-lump at the back of the grate is removed, and a small cast-iron box is fitted in its place, and extends three or four inches backwards into the wall behind the grate. The bottom of this box projects about 2 in. forward over the bottom of the grate, and it is open at the front only. It is fitted with a vertical, movable iron plate, which can be drawn forwards and pushed backwards by means of an arrangement under the bottom of the grate, which consists of a sliding plate, having holes in it, in which the poker can be inserted and used as a lever to actuate the vertical plate in the coal-box. This latter plate having been pushed back, the box is filled with coal, and the fire laid and lighted in the ordinary way. There will be a slight production of smoke at first, but as soon as the fire has burnt up, that will cease. As the fire travels backwards, the gases evolved from the heated coal in the rear are deflected over the incandescent mass, and are thus largely consumed. As the coal burns away in front, fresh fuel is drawn forwards from the box, as explained, and the fire thus replenished. When the plate has been drawn forward to a certain extent it is pushed back and the box at once re-filled with coal.

"Boulder-stones as Grave-stones."—In the burying-ground surrounding the small and ancient church of Corstorphine, a village three miles west from Edinburgh, may be seen a boulder-stone which marks the resting-place of an aged and faithful shepherd. The boulder is of whinstone; is partially smoothed on one side for the lettering of the inscription and date,—1776,—and stands close to the right-hand side of the main entrance to the church. Strange to say, Corstorphine (Torfin's Cross), with its relics of bygone times, its chapel containing the tombs of the Forresters, the ancient lords of the manor, and its immemorial byways, is seldom visited by the antiquary or archæologist. At Strathfillans, on the road between Comrie and the foot of Loch Earn, Perthshire, the parish churchyard stands in the middle of a much-broken Druidical circle, the stones of which, though not inscribed with names or epitaphs, yet have been utilised to indicate the graves of bygone parishioners.

Eastern Exploration.—At the meeting of the Royal Historical Society, on the 20th inst., in the rooms of the Royal Asiatic Society, Albemarle-street, a paper was read by Mr. C. Pfoundes, F.R.G.S., &c., on "The History of Eastern Exploration, Adventure, &c.," in which he drew attention to the practical value of the study of the history of our intercourse with foreign peoples, and also the necessity for paying more attention to the selection and preparation of those who go abroad as traders, skilled workmen, or otherwise. Mr. Pfoundes strongly commented upon the haphazard manner in which young men went away from home in search of employment abroad, totally ignorant of what was before them, and their energies and abilities misdirected; he further announced that steps were being initiated to organise a "bureau of information and advice," for the benefit of those seeking a future in the colonies and other far-off lands.

"Traps."—Mr. G. E. Waring has been commissioned by the National Board of Health, U.S., to conduct a series of practical experiments as to the influence of the flow of water through pipes on the syphoning of traps, and on the action of various flushing devices and junction pieces. He has accordingly invited inventors to send in glass models of full working size,—nothing larger than 4 in. in diameter. After the trial, these models will become the property of the National Board of Health. The result of the trial, whether favourable or unfavourable, will be published in full.

A large New Clock has just been put up in the parish church of Winshill, near Burton-on-Trent. It strikes the hours on a 20 cwt. bell, chimes the Cambridge quarters upon four bells, and shows time on two dials, each 5 *ft.* 6 in. diameter. It is fitted with all the latest improvements, and will undoubtedly prove a great boon to the inhabitants. Messrs. Smith, Midland Steam Clock Works, Derby, have carried out the work.

The Brunswick Monument, Geneva.—The Brunswick monument, built at so great a cost, and illustrated in our pages not long ago, is showing ominous signs of giving way. The *Times* correspondent says,—It is built on land which not many years ago was reclaimed from the lake. Such land is notoriously treacherous, for often beneath it, and only superficially covered, there are enormous holes hollowed out by the ice action when the Rhone glacier swept over the present site of Geneva. In the case of the Brunswick monument precaution was taken to assure its integrity by placing it on a thick and seemingly solid foundation of concrete, but it appears only too probable from present indications that the ground underneath is subsiding, and that the structure is threatened with serious danger, if not with complete destruction.

Corsehill Stone.—In your issue of the 15th inst., under the head of "Stone," you state that the red stone now being supplied for the New Telegraph and Mercantile Offices, Cardiff, is from the Shawk quarries. Kindly note that many of the large and long stones used for the above offices are from the Corsehill Quarries, Annan, N.B., which is the same stone as that used at the "Hand-in-Hand" Insurance Office, corner of Queen Victoria-street and Blackfriars, also the façade of "Ye Gresham," Bucklersbury, by the late Mr. Gould.—S. T.

Shutters.—Messrs. Salmon, Barnes, & Co., of Ulverston, have fitted up the new premises in the Haymarket for Messrs. Adams & Sons, described in our issue of December 25th last, with their iron revolving shutters worked by patent balance-weight motion.

TENDERS

For the erection of stabling, &c., for the London General Omnibus Company, at Kingsgate-road, Kilburn. Mr. A. Tosh, architect. Quantities by Mr. Alfred Jno. S. C. Bolton:—

Jackson & Graham	£4,735 7 0
Warr	4,395 0 0
Pryor	4,390 0 0
Elves	4,328 4 1
French	4,121 7 9
Niblett	4,040 0 0
Haynes	3,975 0 0
Higgs	3,899 0 0
Price & Richardson	3,877 0 0
Coulter	3,854 15 0
Nichols	3,825 0 0
Julian & Co.	3,783 0 0
Allen & Son	3,780 0 0
Richeirs & Mount	3,732 0 0
Beale	3,692 0 0
Judd	3,595 0 0
Ward & Lamble	3,543 0 0
Russell & Cowley	3,533 0 0
Parker	3,477 0 0
Garrud	3,283 0 0
Vaughan	3,184 0 0

For the erection of premises, Lewisham. Mr. George Vickery, architect:—

Conder	£8,875 0 0
Brass	8,490 0 0
Colls	8,340 0 0
Ashby	8,246 0 0
Patrick	8,181 0 0
Lawrance	7,991 0 0
Nightingale	7,572 0 0
Jerrard	7,564 0 0

For alterations and additions to 7, Great St. Helen's. Messrs. Farebrother, Ellis, Clark, & Co., architects:—

Shaw	£1,278 0 0
Hall, Bedall, & Co.	1,212 0 0
Pitman	1,198 0 0
Clemence	1,169 0 0
Colls & Son	1,151 0 0

For river Blackstaff diversion, Belfast. Mr. J. J. Montgomery, engineer:—

H. & J. Martin,* Belfast (accepted)	£19,210 0 0

* The lowest of eighteen tenders,—the highest being 34,469*l.* 7*s.*

For rebuilding Nos. 151, 153, and 155, Cannon-street, and 18, Nicholas-lane, City. Messrs. Taylor & Locke, architects. Quantities by Mr. Clever:—

		Credit for Old Materials.
Little	£24,275 0 0	£183 0 0
Mowlem & Co.	22,600 0 0	100 0 0
Trollope & Sons	22,343 0 0	125 0 0
Rider & Sons	21,558 0 0	220 0 0
Brass	21,428 0 0	135 0 0
Greenwood	20,900 0 0	260 0 0
Boyce	20,639 0 0	140 0 0
McLachlan & Sons	20,018 0 0	245 0 0
Colls & Sons	19,913 0 0	320 0 0
Chappell	19,260 0 0	170 0 0
Morter	19,127 0 0	250 0 0
Conder	18,985 0 0	150 0 0

For two houses at Raynes Park, Wimbledon, for Mr Morrell. Mr. H. Shaw, architect. No quantities:—

Davis	£4,908 0 0
Jackson & Graham	4,434 0 0
Wood	4,176 0 0
Steel Bros.	4,097 0 0
Price & Richardson	3,580 0 0
Garrud	2,965 0 0
Holloway	2,860 0 0
Cass & Beldon	2,829 0 0
Parker	2,638 0 0

For alterations and additions to the Market Tavern, Charterhouse-street, Smithfield. Messrs. Alexander & Gibson, architects. No quantities supplied:—

Bull & Cooper	£379	0	0
Watson & Dennett	377	0	0
Dodds & Robb	369	0	0
Smythe	347	0	0
Spencer & Co.	345	0	0
Niblett	344	0	0
Cass & Belldon	340	0	0
Groome	325	0	0
Price & Richardson	315	0	0
Benson	297	0	0
Reed	295	0	0
Cranston	278	0	0
Smith	276	0	0
Crouch & Tassler	275	0	0
King	270	0	0
Colter	267	0	0
Parker	261	0	0
Lorder	260	0	0
Radley	255	0	0
Clarke	197	0	0
Wall	174	0	0

For the erection of two warehouses in Aldersgate-street, City. Mr. William Brown, architect:—

Crabb (accepted)	£6,560	0	0

For the erection of a pair of villa residences at Matlock Bridge, for Mr. J. W. Potter. Mr. G. E. Statham, architect. The following tenders, amounting to 1,308*l.*, have been accepted:—

Askew, Matlock, mason, &c.
Dalton, Buxton, joiner, &c.

For pulling down and rebuilding No. 90, Oxford-street, and 26, Market-place, W., for Mr. G. A. Polano. Messrs. Polano & Harrington, architects:—

Keys & Head	£5,942	0	0
Booth & Sons	5,710	0	0
Vears & Co.	5,361	0	0
Higgs & Hill	5,360	0	0
Colls	5,344	0	0
Ansell	5,165	0	0
Perry & Co.	4,917	0	0
Shaw	4,842	0	0
Cooper (accepted)	4,715	0	0

For restoring, after fire, the Swan Hotel, Newport Pagnell, Bucks. Messrs. Usher & Anthony, architects:—

Contract No. 1.

Hull, Bedford	£657	0	0
Moore, Bedford	610	0	0
Green & Hull, Wellingborough	555	10	0
Edey & Son, St. Neots	539	10	0
Mills, Newport Pagnel (accepted)	527	0	0

Contract No. 2.

Mills, Newport Pagnel (accepted).

For cellarage at the Cannon Brewery, Newport Pagnel, exclusive of iron columns and girders, for Messrs. Wilmer. Messrs. Usher & Anthony, architects:—

Coverley	£210	13	0
Smith	160	0	0
George	155	0	0
Mills (accepted)	143	0	0

For two dwelling-houses and small farm buildings at Potton, Beds, for Mr. W. T. E. Judd. Messrs. Usher & Anthony, architects:—

Haynes, Sandy	£795	0	0
Gray, Gamlingay	749	17	0
Burnage, Potton	749	0	0
Rainsford, Potton	671	3	0
Peters, Gamlingay	664	0	0
Woodman, Potton (accepted)	637	0	0

For new roads and sewers on the Aldrington Estate, Brighton, for Mr. E. Vaughan and Mr. W. J. Williams. Mr. Chas. Jackson, surveyor:—

No. 3 *Road.*

Oliver (accepted)	£1,170	0	0

No. 20 *Road.*

Oliver (accepted)	900	0	0

For the erection of new warehouse, Fanshawe-street, Hoxton, for Mr. H. Doubleday. Mr. Snooke, architect:—

Merritt & Ashby	£2,155	0	0
Ashby Bros.	2,096	0	0
Greenwood	2,073	0	0
Rider & Son	2,068	0	0
Taylor & Parfitt	1,799	0	0
Wells	1,735	0	0

For rebuilding No. 172, Fleet-street, for Mr. Attneave. Mr. G. Pidding, architect. Quantities supplied by Mr. H. Burton:—

Yardley & Sons	£2,068	0	0
Allard	2,041	5	0
Johnson	1,947	0	0
Higgs	1,837	0	0

For rebuilding premises in Aldersgate-street. Mr. John Collier, architect:—

Crabb	£3,150	0	0

For villa residence at Batley. Mr. William Hanstock, architect:—

Booth & Son, Batley (masons)	£539	0	0
Jackson, Batley (joiner)	250	0	0
Walshaw, Batley (plumber)	85	12	6
Morton Bros., Batley (plasterers)	85	0	0
Thornton, Heckmondwike (slater)	53	0	0

TO CORRESPONDENTS.

"Modern Domestic Architecture" (cancelled, having appeared elsewhere).—Juvenis (our correspondent having misled us on a former occasion into printing a letter which appeared at the same time in three other papers, we decline his present communication. We decline to print "circulars").—W. H. (if drawings are in pen and ink, and such as could be photo-lithographed, Editor would be glad to see them)—R. H. C. (send particulars to accompany view).—L. E. F.—W. S. N.—A. D. F.—G. V.—A. A.—R. R.—E. C.—R. P. S.—W. H. H.—A. D. D.—E. B. F.—W. W.—P. V.—J. & W.—D. P.—T. D.—B. H. & Co—P. G. S.—O. S. & Co.—H. T. S.—Jackplane.—F. E. jun.—J. D. W.—T. F.—C. J.—J. R.—Major G. C—W. A.—S. D.—G. N.—T. & P.—J. H.—S. J. J.—U. & A.—A. E R—J. W. P.—J. W. & Co.—R. F.—W. S.—T. H. E.—C. O. E.—A. G. (no).—T. D. (next week).—N. P. J. (next week).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

NOTICE TO SUBSCRIBERS.

THE INDEX and TITLE-PAGE for Volume XXXIX. (July to December, 1880), were given as a Supplement with the Number of January 15.

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Addressed to No. 46, Catherine-street, W.C.

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Discount to Builders. Illustrated List two stamps. LONDON, S.E.

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PATENT SOLID UNSOLDERED RIDGE PLATES, FOR ITALIAN OR SQUARE ROLL CAP ZINC ROOFING.
By the adoption of this Method the use of Solder is Entirely Dispensed with, and consequently the Danger incurred by the use of Fire-pots is Avoided. The Cost is Lessened and the Durability Increased. Estimates for Zinc Dormers, Flats, &c.
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THE HIGHEST AWARD, A SILVER MEDAL,

HAS BEEN GIVEN TO

CLARK & COMPANY,

FOR THEIR PATENT SELF-COILING REVOLVING

NOISELESS Steel SHUTTERS.

PATENT SAFETY LIFTS AND HOISTS.

Manufacturers of every description of Shop Fronts in Metal, Patent Sun Blinds, Revolving Shutters in Wood and Iron.

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above material for decorative purposes. Wall-panels and Friezes.

MORANT & CO., DECORATORS,

have for many years paid great attention to the use of the above material for decorative purposes. They have now some choice sets of rare CORDOVA and VENETIAN LEATHERS, suitable for Wall-panels and Friezes.

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Manufacturer of the best and cheapest

THIN PARQUET (Turpin's Patent), 5-16 inch thick, prepared on three deal back laminations equal in wear to solid Parquet. Used for veneering old existing deal floors, and is susceptible of removal at pleasure.

(See construction.)

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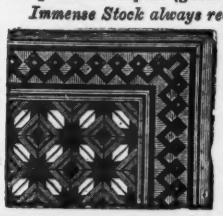
150,000 ft. super. in Stock, ready for Laying.
RIGA INCH OAK FLOOR BOARDS,
1s. per foot super. (grooved and tongued).
Immense Stock always ready for Laying.



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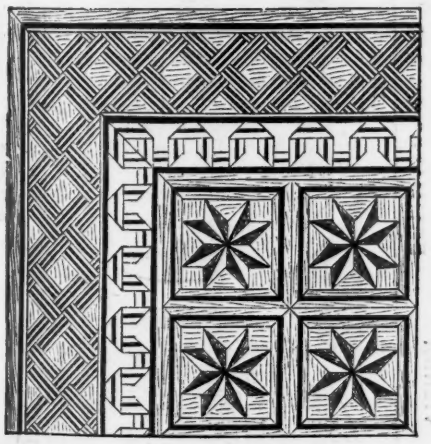
WOOD CARVINGS.

All Styles executed for the Trade at Special Rates. Skilled Artisans sent to all parts of the country.
Estimates and Designs on Application.

NOTICE of REMOVAL to CLERKENWELL ROAD, E.C.

(Opposite the Italian Church, corner of Hatton-garden).



GOLD MEDALS, PARIS, 1878; VIENNA, 1873,
FOR HUNGARIAN OAK BATTEN AND 1-INCH
SOLID PAROUET FLOORING,
Prices from 9d. to 2s. 2d. per ft. super. for 1-in. floors.
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MOSAICS,

GLASS, VENETIAN, AND ROMAN.
Prices from 16s. per yard super., laid complete and polished.

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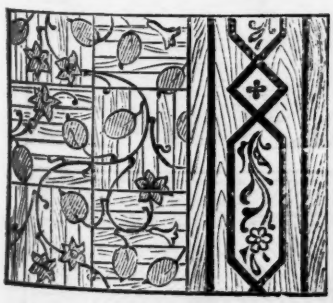

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For Covering Ordinary Floors as Bordering to Carpet.

ALSO LAID ON THE JOISTS IN PLACE OF DEAL BOARDS.

WOOD CHIMNEY-PIECES, PANELLING, DADOS, CEILINGS.

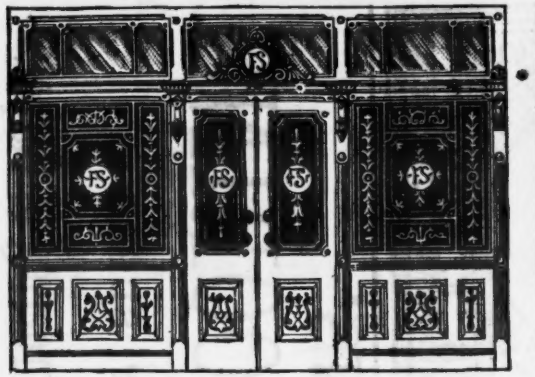
HOWARD & SONS,

DECORATORS AND CABINET MANUFACTURERS,

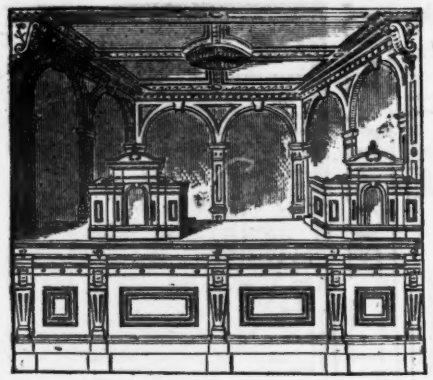
25, 26, & 27, BERNERS STREET.

1. DESIGN FOR A HALL DOOR.

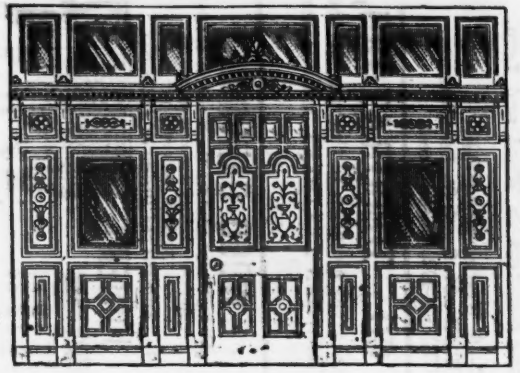
2. BANK OR OFFICE SCREEN.



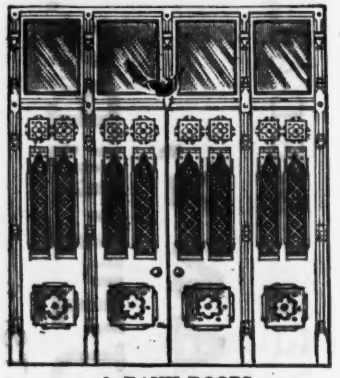
3. BANK INTERIOR, SHOWING COUNTER and DESKS.



4. BANK OR OFFICE SCREEN.



5. VESTIBULE SCREEN.



6. BANK DOORS.

PRIZE MEDALLIST AT THE LONDON, VIENNA, PHILADELPHIA AND CAPE OF GOOD HOPE EXHIBITIONS

7. DESIGN FOR A BAY WINDOW.

FREDERICK SAGE,

MANUFACTURER OF THE BEST CLASS OF HARDWOOD JOINERY FOR BANKS, OFFICES, MUSEUMS, LIBRARIES PRIVATE RESIDENCES, BUFFETS &c.

STEAM WORKS, 80 TO 84, GRAY'S INN ROAD.

1873

VIENNA

LONDON.

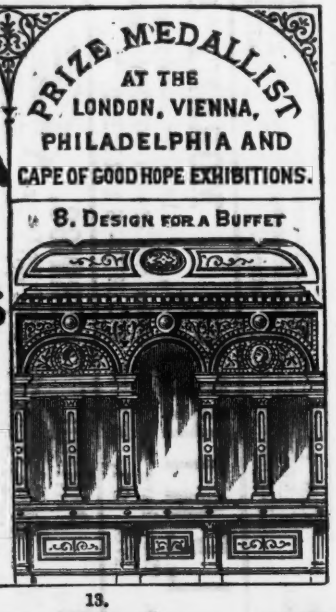
ESTIMATES ON APPLICATION.

1876

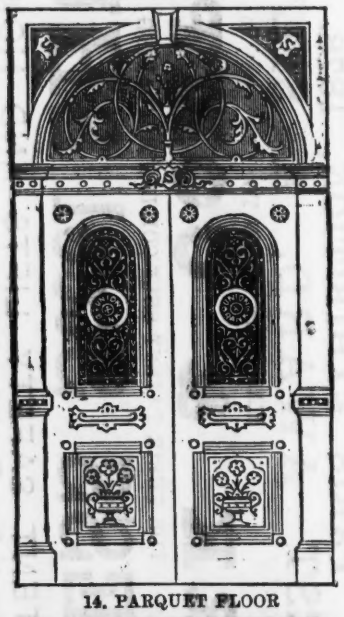
PHILADELPHIA.

PRIZE MEDALLIST AT THE LONDON, VIENNA, PHILADELPHIA AND CAPE OF GOOD HOPE EXHIBITIONS.

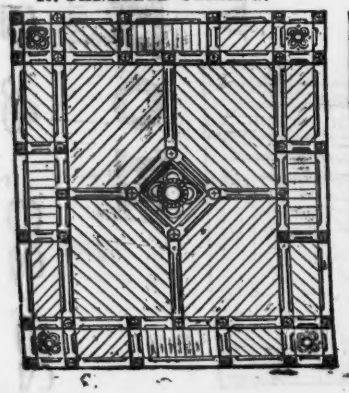
8. DESIGN FOR A BUFFET



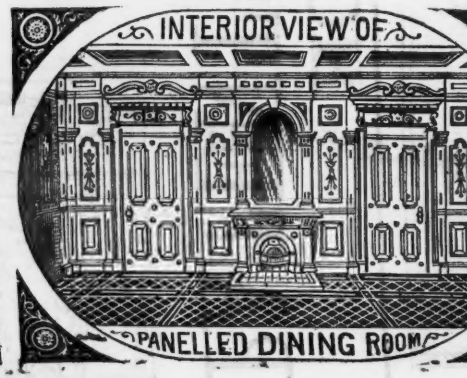
9. BANK DOORS.



10. PANELLED CEILING.

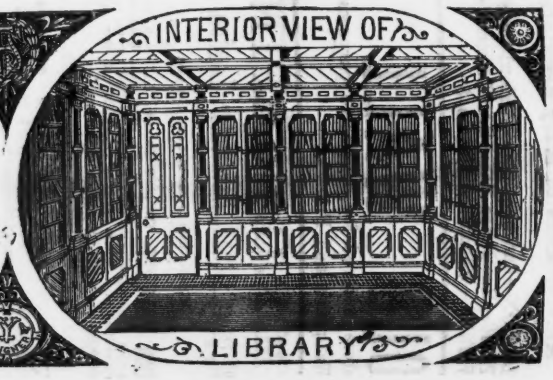


11.

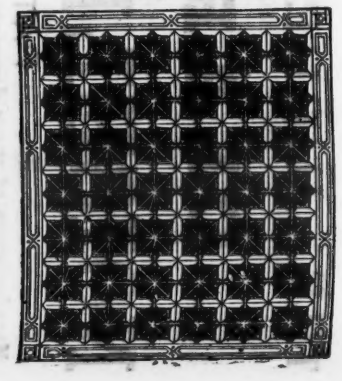


12.

13.



14. PARQUET FLOOR



(ENTERED AT STATIONERS' HALL.)